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PHYCOLOGIA AUSTRALICA;

OR,

A History of Australian Seaweeds;

COMPRISING

COLOURED FIGURES AND DESCRIPTIONS

OF THE MORE CHARACTERISTIC

MARINE ALGÆ OF NEW SOUTH WALES, VICTORIA, TASMANIA, SOUTH AUSTRALIA, AND WESTERN AUSTRALIA,

AND

A SYNOPSIS OF ALL KNOWN AUSTRALIAN ALGÆ.

VOL. V.,

CONTAINING PLATES CCXLI.-CCC.

BY

WILLIAM HENRY HARVEY, M.D., F.R.S.,

MEMBER OF THE ROYAL IRISH ACADEMY, FELLOW OF THE LINNEAN SOCIETY, COR. MEM. OF THE ROYAL ACADEMIES OF UPSAL AND MUNICH; OF THE IMP. ACAD. LEOP. CÆSAR. NAT. CURIOSORUM; HON. MEM. OF THE LYCEUM OF NAT. HIST., NEW YORK, ETC. ETC. ETC.,

AND

PROFESSOR OF BOTANY IN THE UNIVERSITY OF DUBLIN.

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TO

RONALD CAMPBELL GUNN, ESQ., F.R.S., F.L.S.,

OF LAUNCESTON, TASMANIA,

WHO,

WITH HIS ACCUSTOMED LIBERALITY, PLACED AT THE AUTHOR'S DISPOSAL

THE WHOLE OF HIS RICH COLLECTIONS OF

TASMANIAN ALGÆ,

This concluding Volume of the 'Phycologia Australica'

IS GRATEFULLY AND RESPECTFULLY INSCRIBED

BY HIS FRIEND

W. H. HARVEY.

TRIN. COLL. DUBLIN,
Sept. 1, 1863.

PREFACE TO VOL. V.

In closing the 'Phycologia Australica,' after a monthly issue, commencing March 1858, and only recently partially interrupted, it becomes my duty publicly to return my acknowledgments to the friends and friendly correspondents who have assisted me throughout, either with specimens or in other ways. Already, in the dedication of the several volumes, I have endeavoured partially to express towards five of my most strenuous supporters the grateful feelings with which I have received their aid. But I still feel towards them, as if the debt of gratitude which is their due had been but imperfectly discharged.

I wish therefore again, in few words, to recapitulate.

To George Clifton, Esq., R.N., of Fremantle, Western Australia, whose name occurs so frequently throughout the volumes and in the Synopsis, I am indebted for some thousands of beautifully preserved specimens, including many species collected by no one else. His contributions commenced in 1854, whilst I was resident in Western Australia, and have been regularly continued, at short intervals, up to the present time. Three new genera, *Cliftonæa*, *Bindera*, and *Encyothalia*, besides many new species, prove the zeal and success with which Mr. Clifton has conducted his researches.

Dr. Ferdinand Mueller, F.R.S., etc., of Melbourne, who never loses an opportunity of advancing the Natural History of Australia, has for many years diligently collected its Algæ; and with great liberality has placed his gatherings at my disposal, and forwarded to me, from time to time, many important packets of Algæ. To him botanists are indebted for most of what is yet known of the marine plants of North-East Australia, and Phycology owes to his researches the genera *Nizymenia*, *Erythroclonium*, and *Brachycladia*, besides many species. Some of Dr. Mueller's earlier collections, described by Sonder, in vols. 25 and 26 of the 'Linnæa,' have not come into my hands, and several of the species named by Sonder remain unknown to me.

Ronald C. Gunn, Esq., F.R.S., whose name is indelibly associated with the botany of Tasmania, has largely assisted me in this work. From him

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PLATE CCXLI.

NITOPHYLLUM GUNNIANUM, *Harv.*

GEN. CHAR. *Frond* membranaceous, expanded, areolate, unsymmetrical, nerveless or irregularly veined. *Fructification:* 1, hemispherical *conceptacles,* sessile on the frond, containing a tuft of moniliform sporethreads, on a basal placenta; 2, tripartite *tetraspores,* in definite sori or spots, scattered, or confined to some part of the frond.—NITOPHYLLUM (*Grev.*), from *niteo,* 'to shine,' and *φυλλον, a leaf.*

Frons membranacea, expansa, areolata, vage fissa, enervia e basi venulis irregularibus peragrata. Fruct.: 1, *coccidia frondi sessilia, hemisphærica, fila sporifera moniliformia a placenta basali emissa foventia;* 2, *tetrasporæ triangule divisæ, in soros definitos collectæ.*

NITOPHYLLUM *Gunnianum;* stipes short, ribbed with a suddenly vanishing rib, spreading rapidly into a broadly-flabelliform, deeply-cleft, rigidly-membranous, dull-red (when dry turning brownish) frond; segments broadly cuneate, forked or digitate, with the margin minutely erosocrenulate; cystocarps scattered over the whole surface; sori punctiform, very densely scattered toward the apices of the segments.

N. Gunnianum; *stipite brevi-costato, costâ supra stipitem mox evanescente, in frondem latissime flabellatim profunde fissam rigide-membranaceam rubram (siccitate fuscescentem) abeunte; laciniis late cuneatis furcatis digitatisque, margine minute eroso-crenulato; cystocarpiis per totam superficiem sparsis; soris punctiformibus densissime apicem versus sparsis.*

NITOPHYLLUM Gunnianum, *Harv. in Lond. Journ. v.* 6. *p.* 403. *Harv. Ner. Austr. p.* 120. *t.* 47. *J. Ag. Sp. Alg. v.* 2. *p.* 663. *Harv. Alg. Exsic. n.* 287. *Harv. in Fl. Tasm. v.* 2. *p.* 312.

AGLAOPHYLLUM Gunnianum, *Kütz. Sp. Alg. p.* 868.

HAB. Port Philip Heads, *W. H. H.* Georgetown, Tasmania, *R. Gunn.*

GEOGR. DISTR. South coast of New Holland. Tasmania.

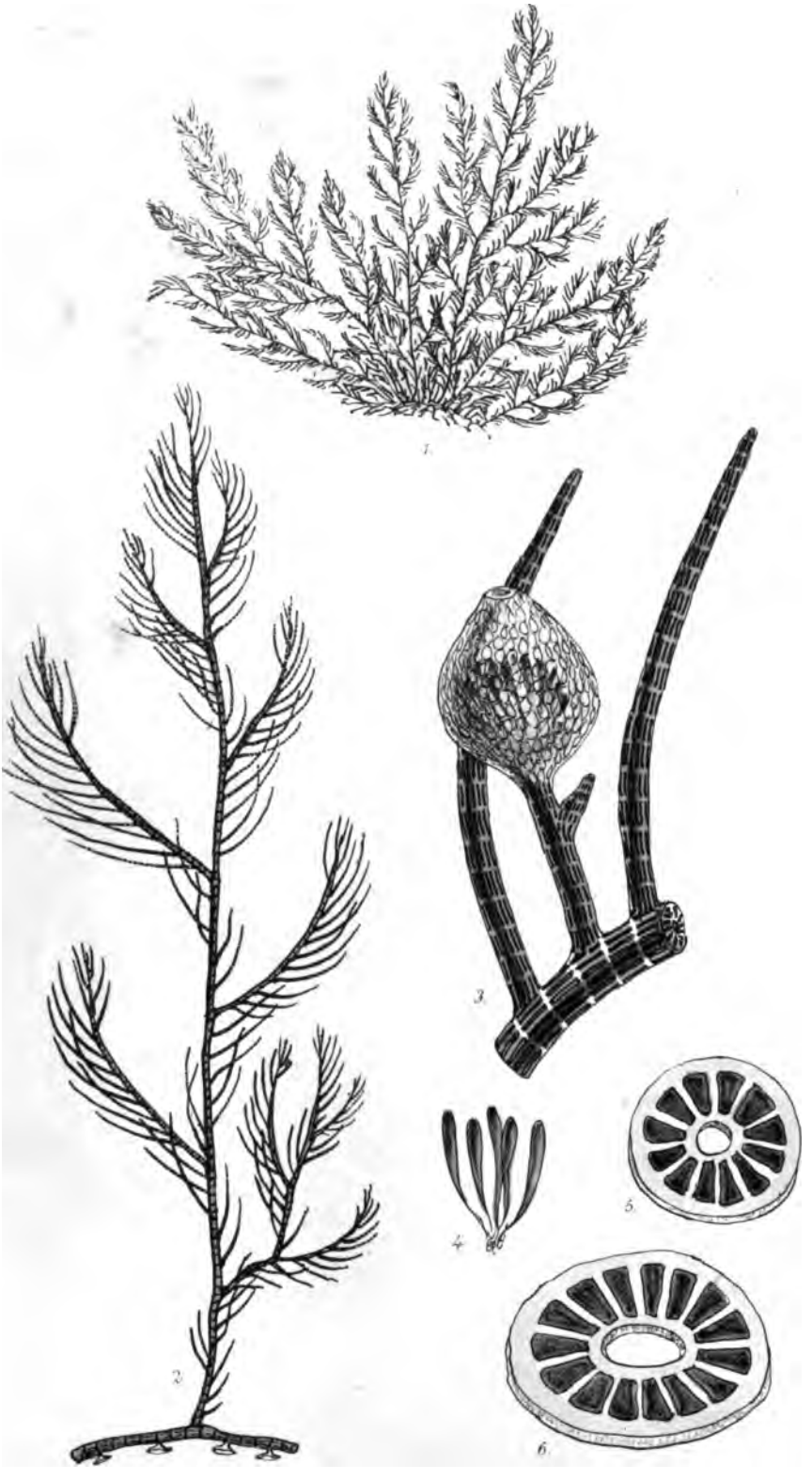
DESCR. *Root* discoid. *Stipes* very short, 1–3 lines long, cartilaginous, soon expanding into the cuneate base of the frond, which it enters as an obscure midrib, continued for a short distance within the margin. *Frond* broadly flabelliform, 6–10 inches long, 8–12 wide, deeply cloven into numerous cuneate segments, which are either bifid or digitate, and variously jagged. These segments are 1–4 inches wide, sometimes nearly entire or merely with a few shallow marginal lobes, but more frequently they are once or twice deeply bifid, the minor divisions being lobed. The axils of the lobes are narrow: the apices blunt; the margin scarcely wavy, but very frequently minutely erose or unequally denticulate. In old specimens the frond be-

comes riddled with roundish holes, after the manner of *Kallymenia cribrosa*. The *conceptacles* are about the size of poppy-seed, dark-coloured, and plentifully sprinkled over the whole surface of the frond. The *sori* of tetraspores are very minute, dot-like, thickly dispersed over the whole surface of the segments, especially the upper ones. The *colour*, when recent, is a rather dull pinky-red; when dry it becomes brownish-red or brown. The *substance*, though thin and membranous, is somewhat rigid, long resisting the action of fresh water; and in drying the mature frond adheres but imperfectly to paper.

The figure of this plant, given in Ner. Austr. t. 47, though correct in outline, is very falsely coloured, having been copied from a badly-preserved and discoloured specimen, "restored," or rather caricatured, by the colourer. I therefore gladly avail myself of the present opportunity to give a more faithful representation of a really fine species. In its broad and little divided fronds, and the rigid substance, it differs from most of the other Australian species; nor has it any very near ally among exotic *Nitophylla*. Among the Australian it comes next to *N. affine* and *N. Curdieanum*, both of which have a very different habit.

Old specimens are very apt to be perforated, and are sometimes completely riddled with round holes. I am not certain whether these perforations are caused by marine worms, or by natural and unequal decay.

Fig. 1. NITOPHYLLUM GUNNIANUM,—*the natural size*. 2. Section through a cystocarp and the frond. 5. String of spores from the same. 4. Small portion of the surface and of the erose margin:—*magnified*.



Vincent Brooks, Imp.

PLATE CCXLII.

POLYSIPHONIA ROSTRATA, *Sond.*

GEN. CHAR. *Frond* filiform, partially or generally articulate; the joints longitudinally striate, composed of numerous cylindrical cells surrounding a central cell (sometimes coated with one or several rows of smaller cells). *Fructification:* 1, ovate or urceolate *ceramidia,* containing a tuft of pear-shaped spores; 2, *tetraspores,* immersed in swollen branches.—POLYSIPHONIA (*Grev.*), from πολυς, *many,* and σιφων, *a tube.*

Frons filiformis, plus minus articulata; articulis longitudinaliter pluristriatis, ex cellulis 4–20 cylindraceis cellulam centralem cingentibus formatis (nunc cellulis minoribus pluriseriatis corticatis). Fruct.: 1, *ceramidia;* 2, *tetrasporæ in ramulis ultimis uniseriatæ.*

POLYSIPHONIA *rostrata;* frond rising from creeping threads, erect, purple; branches short, simple or divided, erecto-patent, falcato-incurved; ramuli secund, filiform, springing from the under side of the branches; articulations about as long as broad; siphons 12–16; conceptacles ovate, terminating shortened ramuli; tetraspores in the ramuli.

P. rostrata; *fronde e filis repentibus orta erecta purpurea; ramis brevibus simplicibus v. raro divisis erecto-patentibus falcato-incurvis; ramulis secundis filiformibus acutis deorsum spectantibus; articulis diametro subæqualibus, siphonibus* 12–16; *ceramidiis ovatis ramulos abbreviatos terminantibus; tetrasporis in ramulis nidulantibus.*

POLYSIPHONIA rostrata, *Sond. in Bot. Zeit.* 1845. *p.* 53. *Pl. Preiss. v.* 2. *p.* 180. *Harv. Ner. Austr. p.* 49. *Alg. Austr. Exsic. n.* 196.

HAB. Parasitical on various *algæ,* W. Australia, *Preiss!* Garden Island and Rottnest, W. Australia, *W. H. H., G. Clifton.*

GEOGR. DISTR. Western Australia.

DESCR. This species originates in prostrate threads or surculi, 1–3 inches long, attached by means of small sucker-discs to the *algæ* on which they grow. These primary surculi throw up, along their upper side, numerous secund *fronds,* which at length become 1–2 inches high. *Fronds* capillary, subsimple, either linear or lanceolate in outline, set throughout with short, simple, erecto-patent, falcato-incurved, alternate branches, each of which is subtended by several scattered, subsecund or spirally-inserted, simple, filiform ramuli. The *branches* are pectinated along their lower (outer) side with similar secund simple ramuli, one of which issues from nearly every node. *Ramuli* 1–2 lines long, subacute. *Articulations* about as long as broad in all parts of the frond, those of the main stem having 12–16 tubes,

those of the ramuli generally with fewer tubes. *Conceptacles* ovate, terminating a ramulus, which is generally shortened to about half the length of a barren ramulus. *Tetraspores* lodged in the ramuli, towards the base, the fertile portion generally tipped with a beak-like barren point. *Colour* a dark, rather dull purplish-red. *Substance* not very soft, long bearing the action of fresh water. In drying the frond adheres, but not very strongly, to paper.

This pretty little species is common in Western Australia, where it was first detected by Preiss, creeping over various algæ, which it sometimes closely covers with its parasitic surculi. It is allied to *P. versicolor*, but differs in substance, in ramification, and in size. It may also be compared with the Antarctic *P. ceratoclada*, and others of the section "*Pennatæ*," but appears to be sufficiently characterized. As yet it has only been found on the west coast of the Australian continent.

Fig. 1. POLYSIPHONIA ROSTRATA, a tuft,—*the natural size.* 2. A frond, rising from the creeping stem. 3. Ramuli and a conceptacle. 4. Spores. 5. Section of a ramulus. 6. Section of the main filament:—*variously magnified.*

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PLATE CCXLIII.

CYSTOPHORA SONDERI, *J. Ag.*

GEN. CHAR. *Root* scutate. *Frond* pinnately decompound, dendroid, with a distinct stem, branches, and ramuliform leaves. *Vesicles* stipitate, simple, rarely absent. *Receptacles* pod-like, torulose or moniliform, developed in the ramuli. *Scaphidia* hermaphrodite. *Spores* obovoid. —CYSTOPHORA (*J. Ag.*), from κυστις, *a bladder*, and φορεω, *to bear.*

Radix scutata. Frons pinnatim decomposita, dendroidea, caule proprio, ramis foliisque ramuliformibus donata. Vesiculæ stipitatæ, simplices, raro nullæ. Receptacula siliquæformia, torulosa v. nodulosa, apice ramulorum evoluta. Scaphidia hermaphrodita.

CYSTOPHORA *Sonderi;* root scutate; stem terete, mostly undivided; branches spreading in every direction, pinnately ramulous, filiform, the ultimate ramuli changing into short, ovato-lanceolate, scarcely torulose receptacles; vesicles between spherical and ellipsoidal, apiculate, about one on each pinnate ramulus.

C. Sonderi; *radice scutata; caule terete sæpius indiviso; ramis undique egredientibus pinnatim ramulosis filiformibus, ramulis ultimis in receptacula brevia ovato-lanceolata vix torulosa abeuntibus; vesiculis ellipsoideo-sphæricis apiculatis in ramulo pinnato subsingulis.*

CYSTOPHORA Sonderi, *J. Ag. Sp. Alg. v.* 1. *p.* 247. *Harv. Alg. Exsic. Austr. n.* 15.

SARGASSUM flaccidum, *Sond. Pl. Preiss. v.* 2. *p.* 164. *Kütz. Sp. Alg. p.* 617.

HAB. West Australia, *Preiss! Mylne! W. H. H.* Port Fairy, *W. H. H.* Port Phillip, Herb. *Areschoug, Dr. F. Mueller.*

GEOGR. DISTR. West and south coasts of Australia.

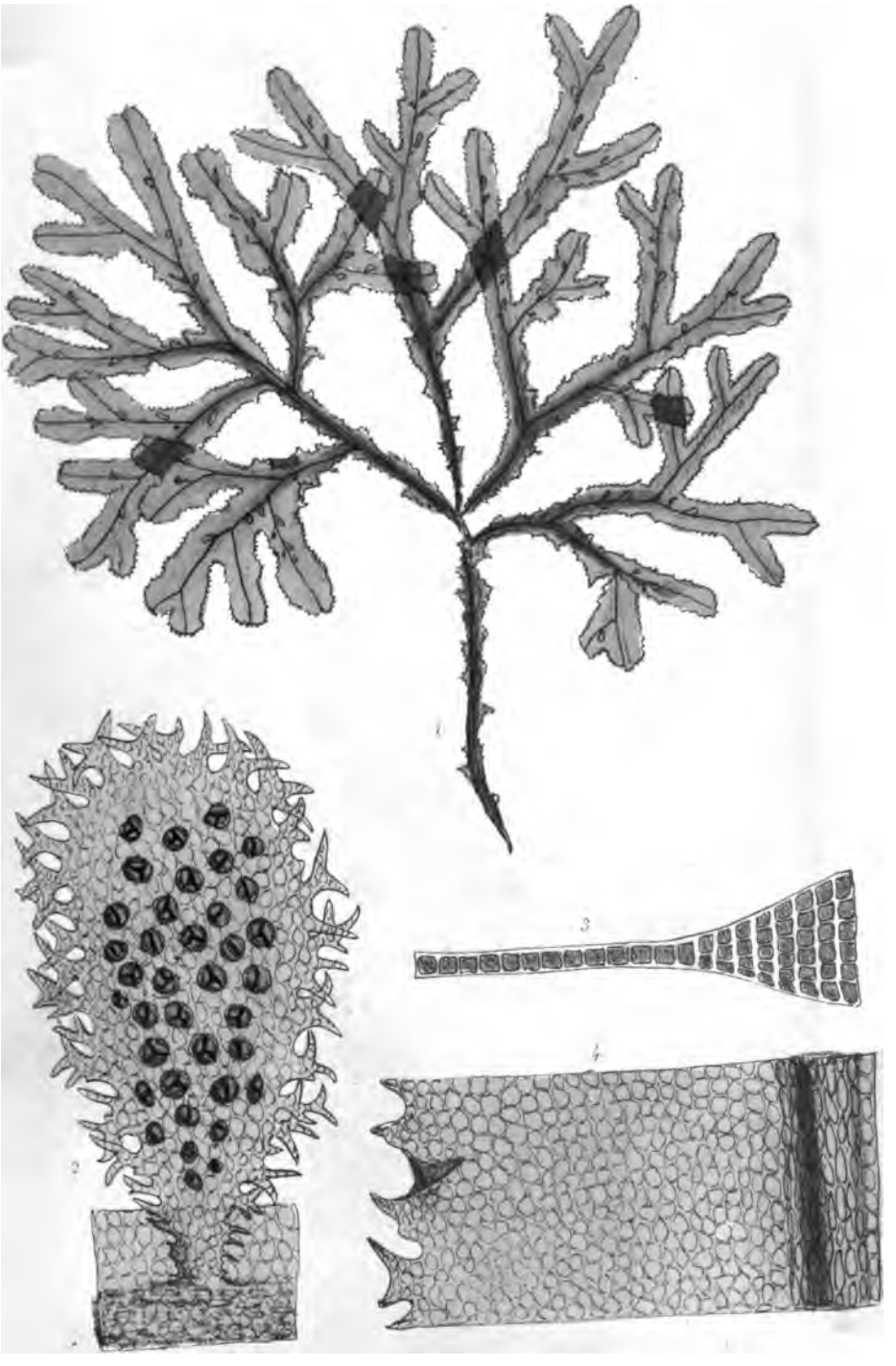
DESCR. *Root* an expanded disc, an inch or more in diameter. *Stem* either undivided or divided near the base into several long, simple, stem-like branches, as thick as crow's-quill or thicker, more or less stripped above the base, and there rough with short, hard, prominent points, being the persistent stumps of broken branches, attenuated upwards, and tapering into a setaceous point, closely beset with lateral branches throughout the greater part of its extent. *Branches* 3–6–8 inches long, horizontally patent, spreading to all sides of the stem, and not deflexed at their insertion, closely pinnated with alternate pinnules. *Pinnules* filiform, dichotomo-pinnulate or multifid, about uncial, their ultimate divisions setaceous with rounded axils. *Vesicles* about a line or 1½ line in diameter, globose or oval, on long, filiform, slender petioles, mucronate, two or more on each multifid pinnule. *Receptacles* 2–3 lines long, aggregated, sometimes bifid, ovato-lanceolate or fusiform, somewhat torulose, much shorter than the ramuli by which they are sub-

tended, containing few *scaphidia*. *Colour* a dark olive, becoming black in the herbarium. *Substance* coriaceous, flaccid and tough.

This species seems to oscillate between the true *Cystophoræ* and the species of *Sargassum* with filiform and dichotomous leaves; but the position of the receptacles, which are formed out of the terminal ramuli of the branches, ought to fix it as a species of *Cystophora*. By Sonder it was referred, though with doubt, to the little known *Fucus flaccidus* of Labillardière, which appears however to differ in its much larger and perfectly spherical muticous vesicles.

Fig. 1. Portion of the middle region of the stem of *Cystophora Sonderi*, with lateral branches. 2. The discoid root:—*both of the natural size.* 3. Part of a pinnule, bearing *vesicles.* 4. Part of a pinnule, with *receptacles*:—*both magnified.*

Plate CXXIV



Vincent Brooks, Imp.

PLATE CCXLIV.

DELESSERIA DENTICULATA, *Harv.*

GEN. CHAR. *Frond* leaf-like, membranaceous, areolated, symmetrical, simple or branched, midribbed. *Fructification:* 1, hemispherical *conceptacles,* sessile on the midrib, or on a lateral nerve, containing a tuft of moniliform spore-threads on a basal placenta; 2, tripartite *tetraspores,* in definite *sori* or spots, on the frond, or on accessory leaflets.—DELESSERIA (*Ag.*), in honour of Baron Delessert, a distinguished patron of botany.

Frons foliacea, membranacea, areolata, symmetrica, simplex v. ramosa, costata. Fruct.: 1, *coccidia in costa venisque frondis sessilia, hemisphærica, fila sporifera moniliformia a placenta basali emissa foventia:* 2, *tetrasporæ triangule divisæ, in soros definitos collectæ.*

DELESSERIA *denticulata;* frond ribbed, dichotomous, rather rigid; segments broadly linear, curled and wavy, with a sharply-toothed margin; rib opaque, cartilaginous, vanishing beneath the apex; membrane formed of bluntly-hexagonal cellules; veins none; sori in obovate, fimbriato-dentate fruit-leaves springing from the midrib.

D. denticulata; *fronde costata dichotoma rigidiuscula; laciniis lato-linearibus crispato-undulatis margine denticulatis; costa opaca cartilaginea apicem versus evanescente; membrana cellulis parvis rotundato-hexagonis; venis nullis; soris in sporophyllis obovatis fimbriatis e costa prorumpentibus.*

DELESSERIA denticulata, *Harv. in Trans. R. I. Acad. v.* 22. *p.* 548. *Harv. Alg. Austr. Exsic. n.* 274.

HAB. Rottnest Island, W. Australia, rare, *W. H. H.*

GEOGR. DISTR. Western Australia.

DESCR. *Root* discoid. *Stipes* 2–3 inches long, cartilaginous, more or less winged with membrane, branching at the summit, and continued as the midrib of several irregularly dichotomous or alternately subdivided, sometimes pinnatifid fronds. *Segments* broadly linear, very obtuse, patent, all traversed by midribs which become obsolete just under the apices, sharply and unequally toothed along the margin, curled and wavy. *Conceptacles* unknown. *Sori* of *tetraspores* lodged in minute, obovate, lacerate or fringed fruit-leaves, which spring from the midribs of the younger segments. The *colour* is a clear, but not very brilliant red, which darkens a little in drying. The *substance* is rigid, though the membrane is formed of but a single stratum of cells, and in drying the frond scarcely adheres to paper.

In the ramification of this species there is some resemblance

to that of the northern *D. alata*, which however differs essentially in the evolution and structure of the membrane, not to mention the obvious character of the denticulate and crisped margin of our plant. There is perhaps a nearer affinity with *D. crispatula*, which differs in substance, in the perfectly entire margin, and in the structure of the midrib.

I found very few specimens at Rottnest, and not having received any from my indefatigable correspondent in Western Australia, I take it for granted that this is one of the rarer species of the genus. The cystocarpic fruit has still to be discovered.

Fig. 1. DELESSERIA DENTICULATA,—*the natural size.* 2. A fruit-leaf, bearing a *sorus* of tetraspores. 3. Section of the membrane of the frond, and semi-section of the midrib. 4. Frustule, showing the surface-cells and the toothed margin:—*all magnified.*

Plate CCXL.

Vincent Brooks Lith.

PLATE CCXLV.

CYSTOPHORA MONILIFERA, *J. Ag.*

GEN. CHAR. *Root* scutate. *Frond* pinnately decompound, dendroid, with a distinct stem, branches, and ramuliform leaves. *Vesicles* stipitate, simple, rarely absent. *Receptacles* pod-like, torulose or moniliform, developed in the ramuli. *Scaphidia* hermaphrodite. *Spores* obovoid. —CYSTOPHORA (*J. Ag.*), from κυστις, *a bladder*, and φορεω, *to bear*.

Radix scutata. Frons pinnatim decomposita, dendroidea, caule proprio, ramis foliisque ramuliformibus donata. Vesiculæ stipitatæ, simplices, raro nullæ. Receptacula siliquæformia, torulosa v. nodulosa, apice ramulorum evoluta. Scaphidia hermaphrodita.

CYSTOPHORA *monilifera;* root scutate; stem flat, decompound-pinnate; pinnæ issuing from the flat side of the stem, bent down at their insertion, at base alternately obtusely aculeate; pinnules dichotomo-pinnated, the ultimate changed into nodoso-moniliform, slender, apiculate receptacles; vesicles numerous, between obovoid and spherical, pointless.

C. monilifera; *radice scutata; caule plano decomposito-pinnato; pinnis a latere plano caulis egredientibus retrofractis, basi aculeis obtusis laxe muricatis; pinnulis dichotomo-pinnatis, ultimis in receptacula nodoso-moniliformia gracilia apiculata abeuntibus; vesiculis numerosis obovoideo-sphæricis muticis.*

CYSTOPHORA monilifera, *J. Ag. Sp. Alg.* 1. *p.* 242. *Harv. in Fl. Tasm.* 2. *p.* 283. *Alg. Austr. Exsic. n.* 4.

BLOSSEVILLEA retroflexa, *Dne. Harv. Lond. Journ. v.* 6. *p.* 414. *Kütz. Sp. Alg. p.* 629.

CYSTOSEIRA retroflexa, *Rich. Austr. p.* 12. *Sond. in Pl. Preiss. v.* 2. *p.* 160.

FUCUS retroflexus, *Turn. Hist. t.* 155 (*not of Labill.*).

HAB. Western and southern coasts, frequent. Tasmania.

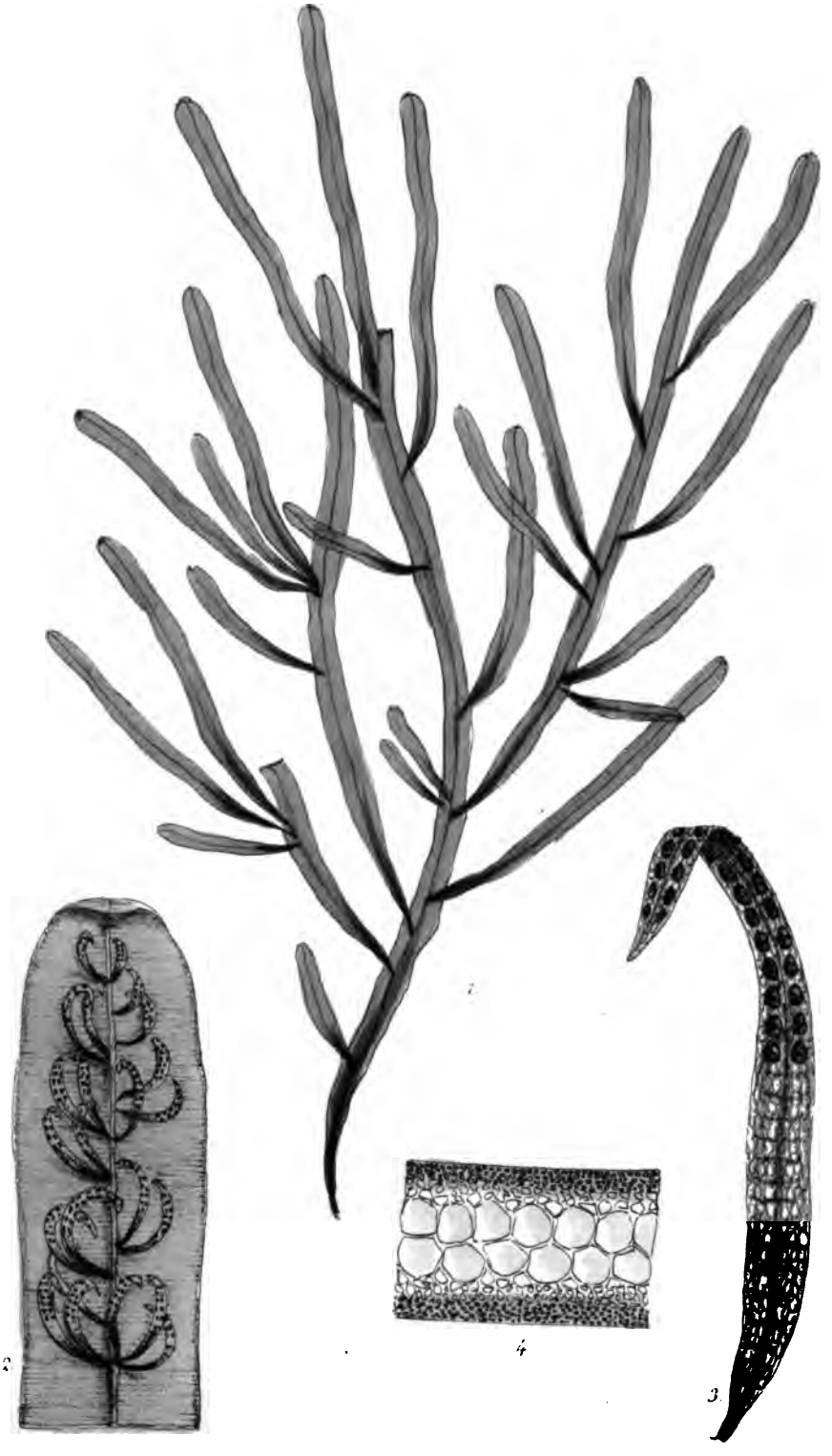
GEOGR. DISTR. As above. New Zealand.

DESCR. *Root* scutate. *Stem* several feet long, decompound, flattened, 2–3 lines wide, the branches proceeding from the flattened side and bent down at their insertion; a peculiarity which runs through all parts of the frond. *Primary branches* or secondary stems 3–4 feet long, pinnated at intervals of about an inch with very patent, closely-branched and decompound pinnæ. These pinnæ are usually bare at base and there set with alternate, rigid, blunt prominences, being the bases of broken branchlets; they are either once, twice or thrice pinnulated, the more divided specimens becoming very dense in ramification. The ultimate *pinnules* are multifid, between pinnate and dichotomous, and are slender and almost setaceous. *Vesicles*

globose, as large as peas, 3 or more borne on short, filiform petioles toward the base of the primary pinnæ. *Receptacles* formed out of all the pinnules indiscriminately, ½–1 inch long, strongly constricted into bead-like pseudo-joints, each containing a *scaphidium*, and usually terminated with a setaceous point. *Colour* dark-olive, becoming black in the herbarium. *Substance* coriaceous, tough.

This is allied to *C. retroflexa* (*Fucus retroflexus*, Labill. t. 260, not of Turner), from which it is easily distinguished by the moniliform receptacles and the nearly-globose vesicles. In *C. retroflexa* the receptacles are sword-shaped, evidently compressed, and much less torulose than is usual in the genus. Both species seem to be equally common, and are distributed along the same coasts, extending to New Zealand.

Fig. 1. Part of a primary branch of CYSTOPHORA MONILIFERA,—*the natural size*. 2. Part of a fertile pinnule, showing the moniliform receptacles,—*magnified*.



Vincent Brooks Imp.

PLATE CCXLVI.

RYTIPHLŒA SIMPLICIFOLIA, *Harv.*

GEN. CHAR. *Frond* compressed or terete, dendroid, pinnate, transversely striate, corticated; the *axis* articulated, composed of a circle of large oblong cells surrounding a central cell; the periphery of several rows of small, angular, (mostly) coloured cells. *Fructification:* 1, ovate *ceramidia,* containing a tuft of pear-shaped spores; 2, *stichidia,* containing tripartite *tetraspores.*—RYTIPHLŒA (*Ag.*), from ρυτις, *a wrinkle,* and φλοιος, *bark;* because the surface is transversely furrowed or striate.

Frons compressa v. teres, dendroidea, pinnatim composita, transversim ruguloso-striata, areolata; axi articulato ex cellulis oblongis magnis pluribus cellulam centralem cingentibus conflato percursa; strato peripherico cellulis pluriseriatis angulatis corticata. Fruct.: 1, *ceramidia;* 2, *stichidia propria, sæpius simplicia, tetrasporas biseriatas includentia.*

RYTIPHLŒA *simplicifolia;* frond leafy, midribbed, repeatedly proliferous from the midrib, and at length falsely much-branched; phyllodia linear, flat or slightly channelled, with a slender midrib, opaque, very delicately striate transversely, obtuse, tapering at base into a short petiole; stichidia linear, involute, tufted, springing from the midrib.

R. simplicifolia; *fronde foliacea costata a costa repetite prolifera et demum spurie ramosissima; foliis linearibus planis v. subcanaliculatis costa tenui percursis opacis tenuissime transversim striatis obtusis basi in petiolo attenuatis; stichidiis linearibus involutis fasciculatis e costa enatis.*

RYTIPHLŒA simplicifolia, *Harv. Alg. Austr. Exsic. n.* 133. *Fl. Tasm. v.* 2. *p.* 298.

HAB. Cast ashore from deep water, rare. Port Fairy, *W. H. H.* Tasmania, *R. Gunn.*

GEOGR. DISTR. South coast of New Holland. Tasmania.

DESCR. *Root* discoid. *Primary leaf* from an inch to 3–6 inches long, from 1–3 lines wide, quite flat or slightly hollow on one side, very obtuse, tapering at base into a short stipes, traversed by a slender midrib, from which numerous similar leaves, 1–3 or more inches in length, are thrown out proliferously, without any definite order. These, in like manner, bear a third, and those a fourth series of similar leaves, until there results (in old specimens) a bushy, much-compounded frond, made up of simple, linear leaflets. All the leaflets are of similar shape; their apices are minutely inflexed or involute; the margin minutely raised toward one surface; the membrane is thickish, opaque, not glossy, and appears under a pocket lens as if delicately and very closely striate transversely. *Conceptacles* unknown. *Sti-*

chidia linear-lanceolate, acute, inflexed or involute, closely placed or tufted along the midribs of the leaflets, containing tetraspores in a double row. The *colour* is a dark brownish-red, becoming darker or blackish in the herbarium. The *substance* is coriaceous and tough, and in drying the frond scarcely adheres to paper, even under heavy pressure.

A rare plant, with the aspect of the narrowest forms of *Lenormandia spectabilis*, but having a very different microscopic structure and fructification, and easily known, with the help of a pocket lens, by the absence of the decussating lines conspicuous in *Lenormandia*, and the presence of the closely-placed, transverse striæ. As yet I have seen very few specimens. The *ceramidia* are still a desideratum.

Fig. 1. RYTIPHLŒA SIMPLICIFOLIA,—*the natural size.* 2. Apex of a leaf (*phyllodium*) bearing *stichidia* along its midrib. 3. One of the stichidia, with its double row of tetraspores. 4. Cross section of the frond :—*variously magnified.*

Vincent Brooks Imp.

PLATE CCXLVII.

CYSTOPHORA PANICULATA, *J. Ag.*

GEN. CHAR. *Root* scutate. *Frond* pinnately decompound, dendroid, with a distinct stem, branches, and ramuliform leaves. *Vesicles* stipitate, simple, rarely absent. *Receptacles* pod-like, torulose or moniliform, developed in the ramuli. *Scaphidia* hermaphrodite. *Spores* obovoid. —CYSTOPHORA (*J. Ag.*), from κυστις, *a bladder*, and φορεω, *to bear*.

Radix scutata. Frons pinnatim decomposita, dendroidea, caule proprio, ramis foliisque ramuliformibus donata. Vesiculæ stipitatæ, simplices, raro nullæ. Receptacula siliquæformia, torulosa v. nodulosa, apice ramulorum evoluta. Scaphidia hermaphrodita.

CYSTOPHORA *paniculata*; root branching; stem terete, decompoundly branched; branches spreading to all sides, bent down at their insertion, naked or laxly alternately spinulose at base, ramuliferous above; ultimate ramuli crowded, setaceo-subulate, simple or forked; receptacles in tufts at the ends of the smaller branches, nodulose, obtuse; vesicles none.

C. paniculata; *radice ramosa; caule tereti decomposito-ramoso; ramis undique egredientibus basi retrofractis inferne nudis v. laxe alterne spinulosis sursum ramuliferis, ramulis ultimis crebris setaceo-subulatis furcatis simplicibusque; receptaculis apice ramorum minorum fasciculatis nodulosis obtusis; vesiculis nullis.*

CYSTOPHORA paniculata, *J. Ag. Sp. Alg. v.* 1. *p.* 248. *Harv. in Fl. Tasm. v.* 2. *p.* 285. *Harv. Alg. Austr. Exsic. n.* 16.

CYSTOSEIRA paniculata, *Ag. Sp. Alg. p.* 76. *Syst. p.* 290.

BLOSSEVILLEA paniculata, *Dne. Kütz. Sp. Alg. p.* 629.

FUCUS paniculatus, *Turn. Hist. t.* 176.

HAB. Kent Islands, Bass's Straits, *Dr. R. Brown*. South Australia, *Dr. Curdie*. Port Fairy, *W. H. H.* Tasmania, *R. Gunn*.

GEOGR. DISTR. South coasts of New Holland. Tasmania.

DESCR. *Root* branching, with many clasping fibres. *Stem* several feet long, as thick as goose-quill near the base, where it throws off several stem-like branches (secondary stems) which are bent downwards at their insertion. These *secondary* stems are undivided, 2 or more feet long, as thick as crow-quill, filiform, smooth or distantly spinuliferous, throwing out numerous lateral branches, from 8–12 inches or more in length. These lateral (*lesser*) branches are bare of branchlets at base or throughout their lower half, and densely beset above with *tertiary* ramuli, spreading to all sides. The *tertiary* branchlets are 2–4 inches long, closely covered with filiform, seta-

ceous, mostly forked, ultimate ramuli, which are more crowded towards the summits. *Vesicles* not known. *Receptacles* formed from the uppermost ramuli of the smaller branches, hence always crowded about the apices, constricted into bead-like nodes, each node containing a *scaphidium*. *Colour* a dark olive, turning black in drying. *Substance* coriaceous, tough.

A "*Cystophora*," without *vesicles*, is as anomalous as the play of 'Hamlet' would be with the character of the Prince of Denmark omitted; and yet, in habit and in the development of the frond there is such close accordance with other *Cystophoræ* that it would be unnatural to separate this species from its congeners. Vesicles, in the *Fucoideæ*, though very constant where they occur, sometimes are present or absent in the same species, and even *Fucus vesiculosus* itself is not unfrequently found without any bladders. Usually vesicles are more common in species that either inhabit shallow water or that float partially on the surface. Probably our *C. paniculata* inhabits the deeper part of the Laminarian zone, where buoys would be comparatively useless to it. Whether its branching root be also an adaptation to fit it for a residence among the *Laminariæ* is uncertain.

Fig. 1. One of the secondary branches of CYSTOPHORA PANICULATA. 2. Base of the stem and root; both *the natural size*. 3. Apex of one of the smaller, fertile branches, with its terminal *receptacles* and a few of its forked ramuli,—*magnified*.

Vincent Brooks, Imp.

PLATE CCXLVIII.

PTEROCLADIA LUCIDA, *J. Ag.*

GEN. CHAR. *Frond* linear, two-edged, imperfectly midribbed, pinnate, composed of three strata; the *medullary* stratum of densely-packed, longitudinal fibres, the *intermediate* of larger, roundish cells; the *cortical* of vertical, moniliform filaments, formed of minute, coloured cellules. *Fructification:* 1, unilocular *conceptacles* hemispherically prominent to one surface of the frond, containing, within a thick pericarp, pedicellated, obovate spores, springing from a parietal dissepiment, which is united to the pericarp by slender filaments; 2, cruciate *tetraspores*, forming sori in dilated ramuli.—PTEROCLADIA (*J. Ag.*), from πτερον, *a wing*, and κλαδος, *a branch.*

Frons linearis, anceps, subcostata, pinnatim decomposita, stratis tribus contexta; medullari ex fibris tenuibus longitudinalibus densissime intertextis, intermedio cellulis majusculis rotundatis, corticali cellulis minutis coloratis in fila verticalia conjunctis composito. Fruct.: 1, *cystocarpia unilocularia in alterutera pagina hemisphærice prominentia, ad placentam parietalem effusam, fibris plurimis cum tecto pericarpii crassi junctam, sporas obovatas longe pedicellatas, foventia;* 2, *tetrasporæ cruciatim divisæ, infra apices ramulorum aggregatæ.*

PTEROCLADIA *lucida*, J. Ag.

PTEROCLADIA lucida, *J. Ag. Sp. Alg. v.* 2. *p.* 483. *Fl. Nov. Zel. v.* 2. *p.* 244. *Harv. in Trans. R. I. Acad. v.* 22. *p.* 551.

GELIDIUM lucidum, *Sond. Pl. Preiss. v.* 2. *p.* 174. *Harv. in Lond. Journ. Bot. v.* 4. *p.* 549. *Kütz. Sp. Alg. p.* 763.

PHYLLOPHORA lucida, *Grev. Alg. Britt. Syn. p.* 56.

SPHÆROCOCCUS lucidus, *Ag. Sp. p.* 290. *Syst. p.* 228.

FUCUS lucidus, *Br. MSS. Turn. Hist. t.* 238.

HAB. Coast of New Holland, *R. Brown.* Western Australia, abundantly. *Preiss! Mylne! W. H. H., G. Clifton.* King George's Sound, *W. H. H.*

GEOGR. DISTR. West and south-west coasts of New Holland. New Zealand.

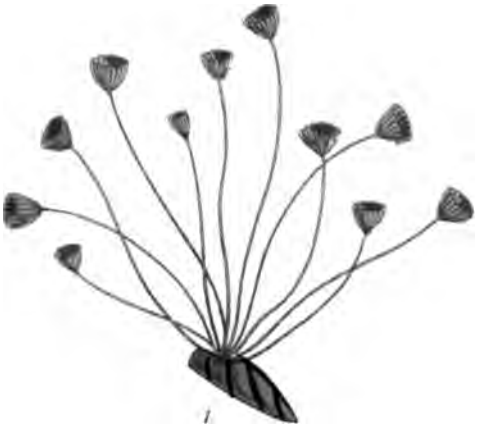
DESCR. *Root* branching. *Frond* 6–12–18 inches long, plano-compressed, thickened in the centre and imperfectly costate, sharply two-edged, 1–3 lines wide, linear, pinnately decompound; very variable in the amount of ramification and in the breadth of the frond. Young specimens are perfectly distichous, twice or thrice pinnated; the pinnæ closely set, erecto-patent, nearly opposite, as are also the pinnules of both series, blunt, rather

broadest in the middle, slightly tapering toward each extremity. Older fronds very frequently become irregularly proliferous from the main stem and from the rachides of the larger pinnæ; in these cases many tripinnate distichous branches are directed to all sides, causing the general frond to lose its distichous aspect and become densely bushy, the fronds and their proliferous frondlets closely imbricating each other. The *midrib* varies much in different specimens; in some it is scarcely obvious, in others strongly marked, very convex, and much thickened. Sometimes the pinnules are short or abortive and crisped; sometimes they are much attenuated, flat, and thin. The *conceptacles* are formed about the middle of the pinnulæ, in dilated portions, and resemble in structure the semi-conceptacle of a *Gelidium*, as if one side only of the conceptacle were developed. The *tetraspores* are cruciate, formed among the cortical filaments of dilated pinnulæ, near the summit. The *colour* is a rather brilliant purplish-red. The surface of the frond is glossy, and retains its gloss in the herbarium. The *substance* is rigid and very tough, coriaceous when growing, somewhat horny when dry, in which state the frond does not adhere to paper.

From *Gelidium*, to which genus it is nearly allied, *Pterocladia* differs in having a one-celled, not a two-celled pericarp, and scarcely by any other character; for *Gelidium proliferum* (Plate CCIV.), as already noticed, unites the fruit proper to *Gelidium* to the habit and frond of *Pterocladia*.

Pterocladia lucida, if all the specimens that pass under this name be justly referable to one species, is nearly as variable a plant as *Gelidium corneum*. Our figure is intended to represent the typical state of the frond, before it has become complicated by proliferous additions. The New Zealand plant may possibly be specifically different, though hitherto I have not succeeded in detecting a valid difference between it and that from West Australia. If all belong to one species, then it is a curious fact that this species should be so common in West Australia and in New Zealand, and not found on the intermediate coasts between these widely-separated centres.

Fig. 1. PTEROCLADIA LUCIDA,—*the natural size.* 2. Apex of a pinna, bearing conceptacles. 3. Vertical section of a conceptacle and of the frond. 4. Apex of a pinna, bearing tetraspores in dilated pinnulæ. 5. Tetraspores:—*all magnified.*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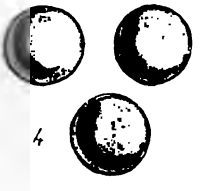
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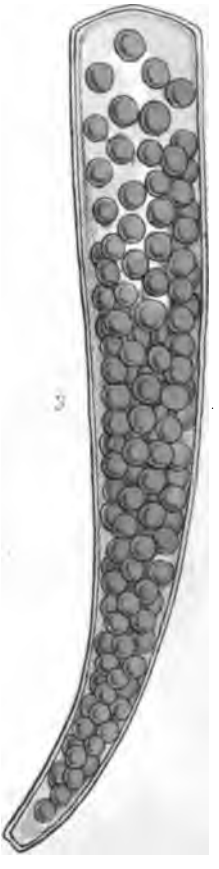
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PLATE CCXLIX.

ACETABULARIA CALYCULUS, *Quoy et Gaim.*

GEN. CHAR. *Root* scutate. *Frond* stipitate, umbrella-shaped, thinly incrusted with carbonate of lime. *Stipes* tubular, unicellular, cylindrical, crowned with a peltate disc formed of numerous radiating cuneiform cells. *Cells* of the disc at first containing granular green matter, which is afterwards changed into spherical spores.—ACETABULARIA (*Lamx.*), from *acetabulum,* a saucer.

Radix scutata. Frons stipitata, umbraculiformis, tenuiter calcareo-incrustata. Stipes tubulosa, monosiphonia, cylindracea, disco peltato e cellulis pluribus cuneiformibus formato coronata. Disci cellulæ primo materie granulari viride repletæ, demum sporis sphæricis farctæ.

ACETABULARIA *Calyculus;* peltate disc cup-shaped; its radii incurved.

A. Calyculus; *disco peltato calyciformi, radiis incurvis.*

ACETABULARIA Calyculus, *Quoy et Gaimard, in Freycinet, Voy. Zool. t.* 90. *f.* 6, 7. *Kütz. Sp. Alg. p.* 510.

CLIFTONELLA Calyculus, *J. E. Gray, in Ann. Nat. Hist. ser.* 3. *v.* 8. *p.* 408.

HAB. West coast of New Holland, *Quoy and Gaimard.* Dredged in Owen's Anchorage, Fremantle, Western Australia, *G. Clifton.*

GEOGR. DISTR. West coast of New Holland.

DESCR. *Root* a minute disc. *Fronds* tufted, 1–3 inches high. *Stipes* setaceous, thinly incrusted with carbonate of lime, whitish, opaque, distantly nodulose, pierced at the nodes by a circle of small holes or scars (being the points of attachment of whorls of byssoid fibres, which accompany the early stages of growth). *Disc* campanulate or cup-shaped, very concave, formed of numerous, strongly-incurved or arched, lineari-cuneate, blunt-topped cells, which are at first filled with yellowish-green grumous matter, and at maturity with innumerable spherical spores. The *spores* are perfectly globose, bright green, and have a toughly-membranous hyaline coat. The substance is rigid, and in drying the frond does not adhere to paper.

The genus *Acetabularia* at present includes three species: one of them a native of the Mediterranean Sea; another, of the West Indies and the tropical ocean generally; the third, the subject of our figure. This Australian species is at once known

by the very concave, almost *campanulate* disc, formed of *arched* cells. The coherence between the cells also appears to be less strong than in the other species; but there is no difference in the stem, which is equally furnished in all with whorls of dot-like scars at intervals. Although the byssoid fibres have not been yet observed in *A. Calyculus*, there can be little doubt that the scars denote the spots from which fibres have fallen.

Mr. Clifton's specimens were attached to the valves of bivalve shells.

Fig. 1. Group of ACETABULARIA CALYCULUS, on a piece of shell,—*the natural size*. 2. Upper part of a frond. 3. One of the radiating cells of the disc, in its mature state, full of spores. 4. Spores:—the latter figures *magnified*.

Plate [illegible]

[illegible]

[illegible] Brooks Imp

PLATE CCL.

CHEILOSPORUM SAGITTATUM, *Aresch.*

GEN. CHAR. *Frond* plano-compressed, calcareous, articulated, dichotomous; articulations obsagittate or obcordate. *Fructification:* 1, *conceptacles* ovoid, immersed in the upper margin of the lobes of the articulations, one in each lobe, furnished with an apical pore and containing in the base of the cavity a tuft of erect, at length four-parted, spore-threads. —CHEILOSPORUM (*Dne.*), from χειλος, *a lip,* and σπορος, *a seed,* in allusion to the marginal fruit.

Frons plano-compressa, calcarea, articulata, dichotoma; articulis obsagittatis v. obcordatis. Fruct.: 1, *conceptacula ovoidea, in margine loborum superiore articulorum utrinque immersa, apice poro pertusa, in fundo loculi fila sporifera fasciculata erecta demum quadripartita foventia.*

CHEILOSPORUM *sagittatum;* frond robust, stipitate, becoming broader upwards; articulations of the branches deeply sagittate, tapering at base; lobes patent, broadly subulate, acute.

Ch. sagittatum; *fronde robusta stipitata sursum subdilatata, articulis ramorum profunde sagittatis basi attenuatis, lobis patentibus late subulatis acutis.*

CHEILOSPORUM sagittatum, *Aresch. in J. Ag. Sp. Alg. v.* 2. *p.* 545. *Harv. Alg. Austr. Exsic. n.* 445.

AMPHIROA sagittata, *Dne. Ann. Sc. Nat.* 1842. *Harv. Ner. Austr. p.* 102.

CORALLINA sagittata, *Lamx. in Freyc. Voy. Zool. p.* 625. *t.* 95, *f.* 11, 12.

HAB. Swan River, *Preiss.* Kiama, New South Wales, on tidal rocks, *W. H. H.*

GEOGR. DISTR. Mauritius. Port Natal and Algoa Bay, South Africa.

DESCR. *Root* a spreading calcareous crust. *Fronds* densely tufted or spreading over wide patches, 2–4 inches high, half a line to nearly a line in breadth, stipitate, many times regularly dichotomous above the middle, flabelliform in outline and fastigiate. Lower *articulations* obconical, with short appressed lateral lobes; middle and upper *articulations* deeply sagittate, compressed, with a trace of midrib, their lobes broadly subulate, spreading, acute or subacute. The terminal *articulation* of branches and ramuli is either obovate or obcordate. *Conceptacles* (on a South African specimen) ovoid, half immersed in the upper edge of the lateral lobes of the joints, especially towards the ends of the branches, containing a tuft of four-jointed spore-threads. When deprived of lime by acid, the articulations are elegantly banded by alternate bands of roundish and of linear cells. The *colour,* when growing, is a deep and rather bright purple-red, which becomes

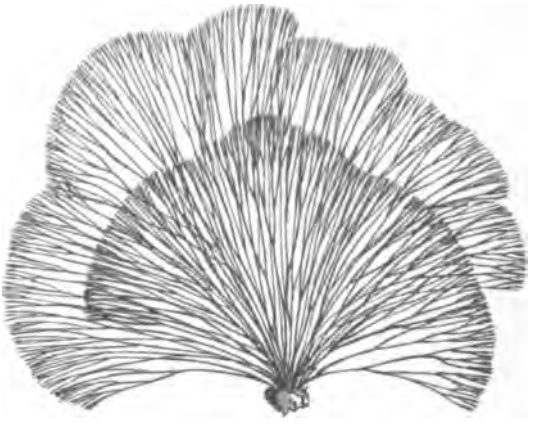
duller on drying, and on exposure the frond fades to a chalky-white. The *substance* is rigid and fragile, and the frond does not adhere to paper in drying.

The genus *Cheilosporum* has been separated by Areschoug from *Amphiroa*, to which it is nearly allied, and from which it differs merely by the position of the conceptacles. In *Amphiroa* the conceptacles, one or many, are developed from all parts of the surface of the articulations; in *Cheilosporum* there are never more than *two* on any articulus, and these are placed, one at each side, on the edge of the projecting upper angle of the articulus.

C. sagittatum is a native of the Mauritius and of South Africa. The Australian specimens agree very nearly with specimens received from Algoa Bay. As they are not in fruit, I have, at figs. 3 and 4, represented magnified fragments of a fertile specimen of the South African plant.

C. elegans, of New Zealand, is very closely, perhaps too closely, allied to the present, but is a slenderer plant.

Fig. 1. CHEILOSPORUM SAGITTATUM,—*the natural size.* 2. Apex of a branch, with ramuli. 3. Fertile articulations, with ceramidia. 4. A fertile lobe, with its *ceramidium*, after the lime has been removed by acid:—*magnified.*



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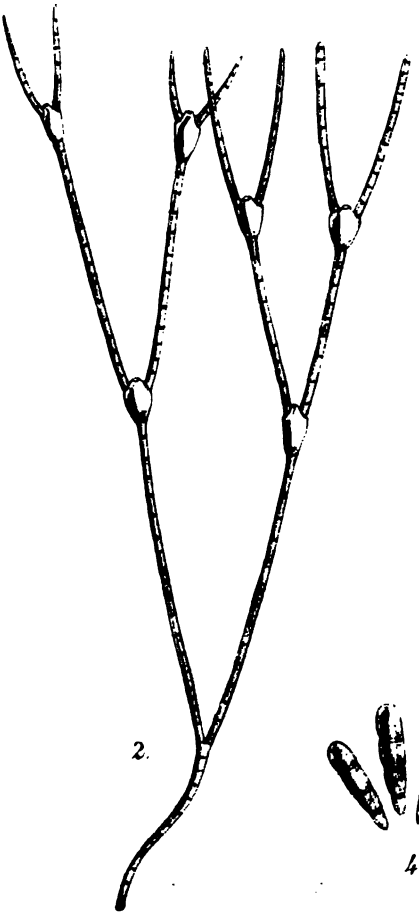

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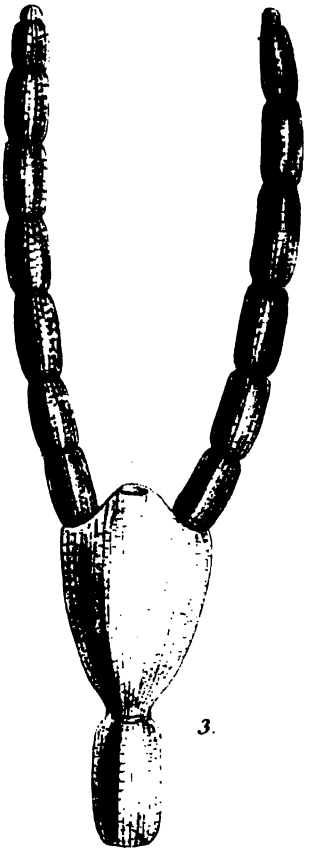

3.

PLATE CCLI.

JANIA FASTIGIATA, *Harv.*

GEN. CHAR. *Frond* subterete, setaceo-filiform, calcareous, articulated, dichotomous; articulations cylindrical or compressed. *Fructification:* 1, conceptacles urn-shaped, formed in the forks of the upper branches, furnished with an apical pore, and containing in the base of the cavity a tuft of erect, at length four-parted, spore-threads.—JANIA (*Lamx.*), from *Janira,* one of the Nereides.

Frons subteres, setaceo-filiformis, calcarea, articulata, dichotoma; articulis cylindraceis v. compressis. Fruct.: 1, *conceptacula urnæformia, transformatione articuli dichotomiarum superiorum infimi exorta, apice poro pertusa, in fundo loculi fila sporifera fasciculata erecta demum quadripartita foventia.*

JANIA *fastigiata;* frond tall (2–3 inches high), fastigiate, dichotomous, with very acute axils; branches straight, erect; apices subinflated; all the articulations cylindrical, the lowest once and a half as long as broad, the upper 2–3 times as long; the nodes constricted.

J. fastigiata; *fronde elata* (2–3 *uncias alta*) *fastigiata dichotoma axillis acutissimis, ramis strictis erectis, apicibus subinflatis, articulis omnibus cylindraceis, infimis diametro sesquilongioribus, superioribus diametro duplo v. subtriplo longioribus, geniculis constrictis.*

JANIA fastigiata, *Harv. Ner. Austr. p.* 107. *Aresch. in J. Ag. Sp. Alg. v.* 2. *p.* 556. *Harv. Alg. Austr. Exsic. n.* 448.

HAB. Port Fairy, rare, *W. H. H.*

GEOGR. DISTR. Algoa Bay and Simon's Bay, Cape of Good Hope.

DESCR. *Root* crustaceous, accompanied by curled filaments. *Fronds* densely tufted, 2–3 inches high, as thick as horsehair, regularly dichotomous several times, fastigiate; the axils all acute and the filaments straight and erect. The *apices* are frequently a little distended, swollen, and sphacelate. The *ceramidia* are formed abundantly in most of the upper axils of fertile specimens by the transmutation of the axile cell, and are exactly urn-shaped, with a projecting orifice. The *spore-threads* are slightly club-shaped, composed of four spores. The *articulations* are about twice as long as broad, nearly uniform throughout the frond. The *colour,* when recent, is a deep purplish-red, becoming paler and less purple in drying. The *substance* is rigid and rather fragile, and the plant does not adhere to paper in drying.

One of the largest and handsomest species of *Jania,* as that

genus is now restricted by Areschoug. It differs from *J. rubens* in its much greater size, its longer articulations, and the very erect ramification and strictly fastigiate tips. The Australian specimens are abundantly in fruit, and closely agree with the original South African ones, described in 'Nereis Australis,' except in having not quite such long articulations. But this character varies on the African coast.

A much commoner plant, on the Australian continent, is *J. micrarthrodia*, Lamx., which is known by its great tenuity, small size, and very short articulations. It abounds all along the west and south coasts, and may occur to the northward and eastward.

Fig. 1. JANIA FASTIGIATA,—*the natural size.* 2. Upper branches, with *ceramidia* in the forks. 3. A *ceramidium*, with its two terminal ramuli, after the lime has been removed by acid. 4. Spore-threads:—*magnified.*

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PLATE CCLII.

PHACELOCARPUS COMPLANATUS, *Harv.*

GEN. CHAR. *Frond* compressed, distichously pectinate, or subterete, and quadrifariously aculeate, formed of three strata surrounding a central articulate filament or tube; *medullary* stratum of longitudinal, densely interwoven filaments; *intermediate* of larger, roundish cells; *cortical* of minute, coloured, vertically-seriated cellules. *Fruits* of both kinds external, pedicellate or sessile. *Cystocarps* (imperfectly known). *Receptacles* of tetraspores ovoid or globose, containing within numerous cavities parietal zonate *tetraspores* mixed with simple paranemata.—PHACELOCARPUS (*Endl.*), from φακελος, a *tuft* or *fascis*, and καρπος, *fruit:* the fruit is club-shaped in the typical species.

Frons compressa, distiche pectinata, aut teretiuscula et quoquoversum aculeata, triplici strato tubum articulatum centralem ambiente contexta; strato medullari filis longitudinalibus densissime intertextis, intermedio cellulis majoribus rotundatis, corticali cellulis minutis coloratis verticaliter seriatis. Fructus utriusque generis externi, pedicellati v. sessiles. Cystocarpia (vix nota). Receptacula tetrasporarum ovoidea v. globosa, in cryptis numerosis infra peripheriam exsculptis tetrasporas zonatim divisas parietales inter paranemata nidulantes foventia.

PHACELOCARPUS *complanatus;* frond narrow, plano-compressed, with an immersed and obsolete midrib, decompound; branches and ramuli pectinato-pinnatifid, the laciniæ subulate and distichous; nemathecia minute, globose, sessile beneath the tips of the laciniæ.

P. complanatus; *fronde angusta plano-compressa immerse v. obsolete costata decomposita, ramis ramulisque pectinatim pinnatisectis, lacinulis subulatis distichis, nematheciis minutis globosis infra apices lacinularum sessilibus.*

PHACELOCARPUS complanatus, *Harv. Alg. Austr. Exsic. n.* 306; *Fl. Tasm. v.* 2. *p.* 313.

HAB. Mouth of the Glenelg, *Dr. Curdie!* Port Fairy, *W. H. H.* Warramboul, *H. Watts.* Port Philip Heads, *T. E. Rawlinson.* Southport, Tasmania, *C. Stuart.*

GEOGR. DISTR. South coast of New Holland. Tasmania.

DESCR. *Root* a broad scutate disc, ½–1 inch in diameter. *Fronds* solitary or few together, branched almost from the very base, 6–12 inches long or more, uniformly ½–1 line in diameter. *Branches* dichotomous or irregularly alternately decompound, erecto-patent, with acute axils, the lesser divisions somewhat virgate. The lower part of the *stem* and of the larger *branches*,

in old specimens, is cylindrical, without lateral teeth; but every other portion of the frond is closely pectinato-pinnatifid, with broadly-subulate, flat, slightly-incurved, alternate laciniæ, which are about equal in length to the broadly-linear undivided portion or jugament of the frond. The *midrib* is immersed, more or less prominent, and in the younger portions rather obsolete. The *nemathecia* are very minute, globose, and sessile a short distance below the apex of the laciniæ, in fertile specimens. The *colour* is a dark purplish-red, which is either preserved in drying or becomes darker and browner. The *substance* is tough, somewhat horny when dry, in which state the frond does not adhere to paper.

A flatter and more slender plant than *Phacelocarpus Labillardieri* (Plate CLXIII.), with more closely placed and not so deeply cut marginal laciniæ, a darker colour, and, above all, a different fructification. If the fructification here represented be normal, it would in itself suffice to mark this species; but it is so very different from that of the typical species, that I hesitate to consider it so. However this may be, the tubercles contain *tetraspores* of the form and structure proper to the genus.

P. complanatus, originally discovered by Dr. Curdie at the mouth of the Glenelg, seems to be not uncommon along the coast, eastward as far at least as Port Phillip, and occurs also in Tasmania. By much the handsomest specimens I have seen are those received from Mr. Rawlinson, through the kindness of Dr. Mueller.

Fig. 1. A branch of PHACELOCARPUS COMPLANATUS,—*the natural size.* 2. Apex of a branch. 3. Two fertile lacinulæ, bearing *nemathecia.* 4. Tetraspores. 5. Cross section of the stem:—*more or less magnified.*

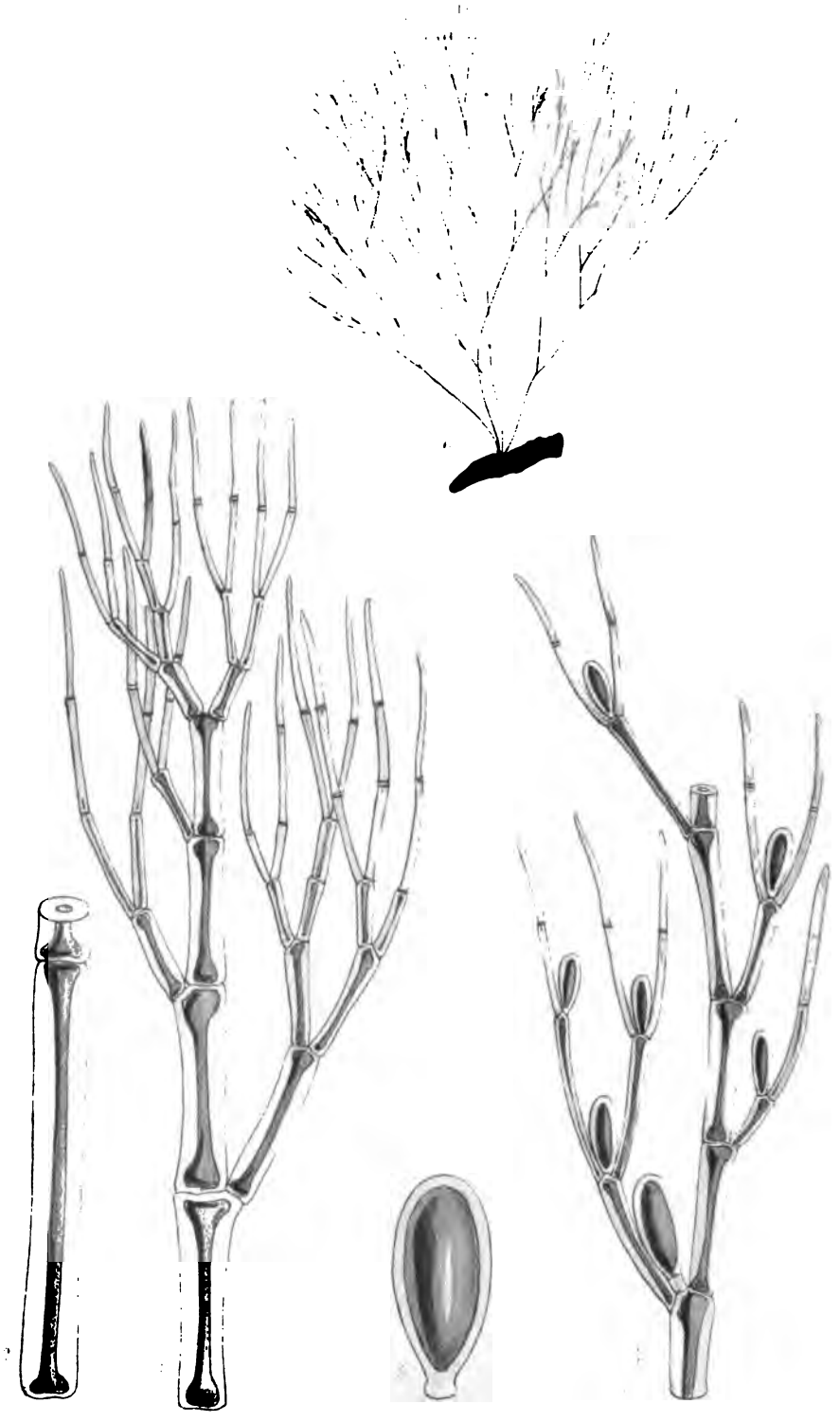


PLATE CCLIII.

CORYNOSPORA AUSTRALIS, *Harv.*

GEN. CHAR. *Frond* filiform, dichotomous, pellucidly articulate, monosiphonous. *Fructification:* 1, involucrated *favellæ,* containing within a hyaline envelope numerous angular spores; 2, obovate-pyriform naked *tetraspores* (?), formed out of terminal articulations, and having an undivided nucleus.—CORYNOSPORA (*J. Ag.*) from *κορυνη, a club,* and *σπορα, a spore.*

Frons filiformis, dichotoma, pellucide articulata, monosiphonia. Fruct.: 1, *favellæ involucro ramulorum incurvatorum cinctæ, intra periderma hyalinum sporas plures angulatas foventes;* 2, *tetrasporæ (?) morphosi articuli terminalis formatæ, obovato-pyriformes, nudæ, nucleum indivisum continentes.*

CORYNOSPORA *australis;* frond setaceous, gelatinoso-membranaceous, dichotomous-decompound and alternately ramuliferous; branchlets several times forked, the lesser ones very slender; apices much attenuated; articulations of the branches very long, not contracted at the nodes; tetraspores oblong, subsessile.

C. australis; *fronde setacea (biunciali) gelatinoso-membranacea; dichotomo-decomposita et alterne ramulifera; ramulis pluries furcatis, minoribus tenuissimis; apicibus attenuato-arachnoideis; articulis ramorum longissimis ad genicula nec contractis; tetrasporis oblongis, subsessilibus.*

CORYNOSPORA australis, *Harv. in Trans. R. I. Acad. v.* 22. *p.* 559; *Alg. Austr. Exsic. n.* .

HAB. Parasitic on various Algæ, rare. Rottnest Island, *W. H. H.* Fremantle, Western Australia, *G. Clifton.* Port Philip, *Dr. Mueller.*

GEOGR. DISTR. Western and southern coasts of Australia.

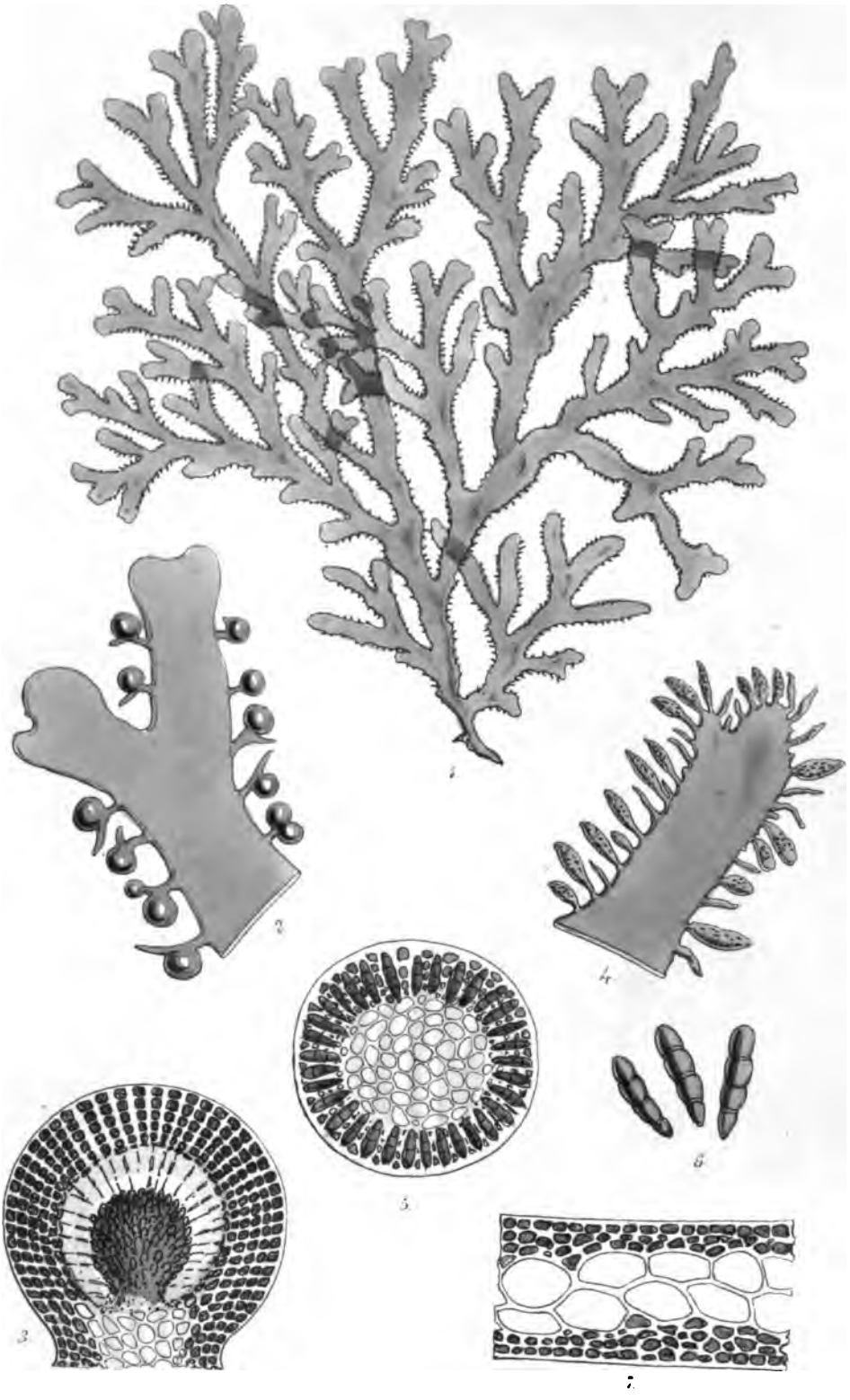
DESCR. *Root* a small disc. *Fronds* tufted, 2–3 inches high, as thick as hog's bristle at base, much attenuated upwards, soon becoming capillary, and thence attenuated to an excessive cobwebby fineness, repeatedly dichotomous, the upper branches beset with short lateral branchlets. *Branchlets* 2–4 lines long, very slender, several times regularly forked, the apices much drawn out and excessively slender, subacute. *Tetraspores* formed in the axils of most of the upper forks, oblong, scarcely pedicellate or subsessile, with an undivided dark-red nucleus. *Articulations* of the larger branches many times longer than broad, with a narrow endochrome, cylindrical, not contracted at the nodes; those of the upper branches and ramuli similar, but much shorter. *Colour* rosy, becoming darker and sometimes brownish in

the herbarium. *Substance* very soft and gelatinous, soon decomposing. In drying it closely adheres to paper.

The genus *Corynospora*, founded on the old *Callithamnion pedicellatum* (Phyc. Brit. t. 212), has been separated from *Callithamnion* by Prof. Agardh on account of the difference in its tetrasporic fruit; the tetraspores of *Callithamnion* having the tripartite structure common to the *Ceramiaceæ*, those of *Corynospora* having an undivided nucleus. Two other Australian species, besides the present, belong to *Corynospora*. Our *C. australis* is readily known from the more slender states of *C. pedicellata* by the very slender terminal ramuli. As yet, I have seen very few specimens of it.

Fig. 1. CORYNOSPORA AUSTRALIS,—*the natural size*. 2. One of the articulations of a large branch. 3. Apex of a branch, with lateral, forked, attenuated ramuli. 4. Fertile ramulus, with tetraspores. 5. A tetraspore:—the latter figures *magnified*.

Plate CCLV.



Vincent Brooks Imp.

PLATE CCLIV.

RHODOPHYLLIS BLEPHARICARPA, *Harv.*

GEN. CHAR. *Frond* flat, membranous, dichotomously or pinnately decompound, mostly margined with leafy or slender processes, and composed of two strata of cells; the medullary stratum formed of roundish-angular cells, the cortical of coloured cellules in one or few rows. *Fructification:* 1, marginal, external conceptacles, containing within a pericarp formed of radiating filaments, a compound nucleus, formed of bundles of spore-threads radiating from a basal (or central) placenta; 2, zonate *tetraspores,* immersed in the peripheric cells of the segments or marginal processes.—RHODOPHYLLIS (*Kütz.*), from ῥοδεος, *red,* and φυλλον, *a leaf.*

Frons plana, membranacea, dichotome v. pinnatim decomposita, segmentisque ciliisve marginalibus obsita, stratis duobus contexta; strato medullari cellulis rotundato-angulatis, corticali cellulis coloratis uni- v. pauci-seriatis composito. Fruct.: 1, *cystocarpia marginalia, externa, pericarpio filis moniliformibus radiantibus conflato munita, nucleum compositum ex fasciculis filorum radiantium formatum foventia; filis demum in sporas solutis;* 2, *tetrasporæ zonatim divisæ, fronde v. lacinulis marginalibus immersæ.*

RHODOPHYLLIS *blepharicarpa;* frond membranaceous, subdichotomous or irregularly multifid; laciniæ linear, spreading, obtuse, fringed throughout with minute processes; cystocarps and tetraspores both formed in the marginal processes.

R. blepharicarpa; *fronde membranacea subdichotoma v. vage multifida, laciniis lato-linearibus patentibus obtusis margine ciliato-fimbriatis, cystocarpiis tetrasporisque in ciliis marginalibus evolutis.*

RHODOPHYLLIS blepharicarpa, *Harv. Alg. Austr. Exsic. n.* 301.

CALLIBLEPHARIS Preissii, *Harv. in Trans. R. I. Acad. v.* 22. *p.* 550. *n.* 192 (*excl. syn.*).

HAB. Garden Island and Rottnest, *W. H. H., G. Clifton.*

GEOGR. DISTR. Western Australia.

DESCR. *Root* discoid. *Frond* 4–5 inches long and as much in expansion, divided from the base into several segments, which are repeatedly subdivided in an irregularly dichotomous or alternate manner. *Laciniæ* nearly linear, 3–5 lines in breadth, nearly of uniform width in each specimen, obtuse, or the extremities bifid, in most cases fringed with short, filiform, or awl-shaped ciliary processes. *Fructification* of both kinds formed in the cilia. *Concep-*

tacles globose, solitary or in pairs; in the former case generally below the apex of the cilium, and resembling a bird's head and beak. *Tetraspores* vertically placed among the peripheric cells of the cylindrical processes. The *colour* is a rather purplish- but pale-red, becoming darker and browner in drying. The *substance* is soft, but not gelatinous, and in drying the frond closely adheres to paper.

This species may readily be known from its nearest allies by the position in the marginal cilia of both kinds of fruit. Fertile specimens are densely fringed with marginal processes, and they are found in greater or less development even in those that are not in fruit.

As far as I am aware, *Rhodophyllis blepharicarpa* is confined to the west coast of New Holland, where it is not uncommon.

Fig. 1. RHODOPHYLLIS BLEPHARICARPA,—*the natural size.* 2. Apex of a lacinia, bearing *cystocarps.* 3. Section through a cystocarp. 4. Apex of a lacinia, bearing *tetraspores* in the marginal processes. 5. Section of a marginal process, showing the *tetraspores in situ.* 6. *Tetraspores,* extracted. 7. Section of the frond:—the latter figures *magnified.*

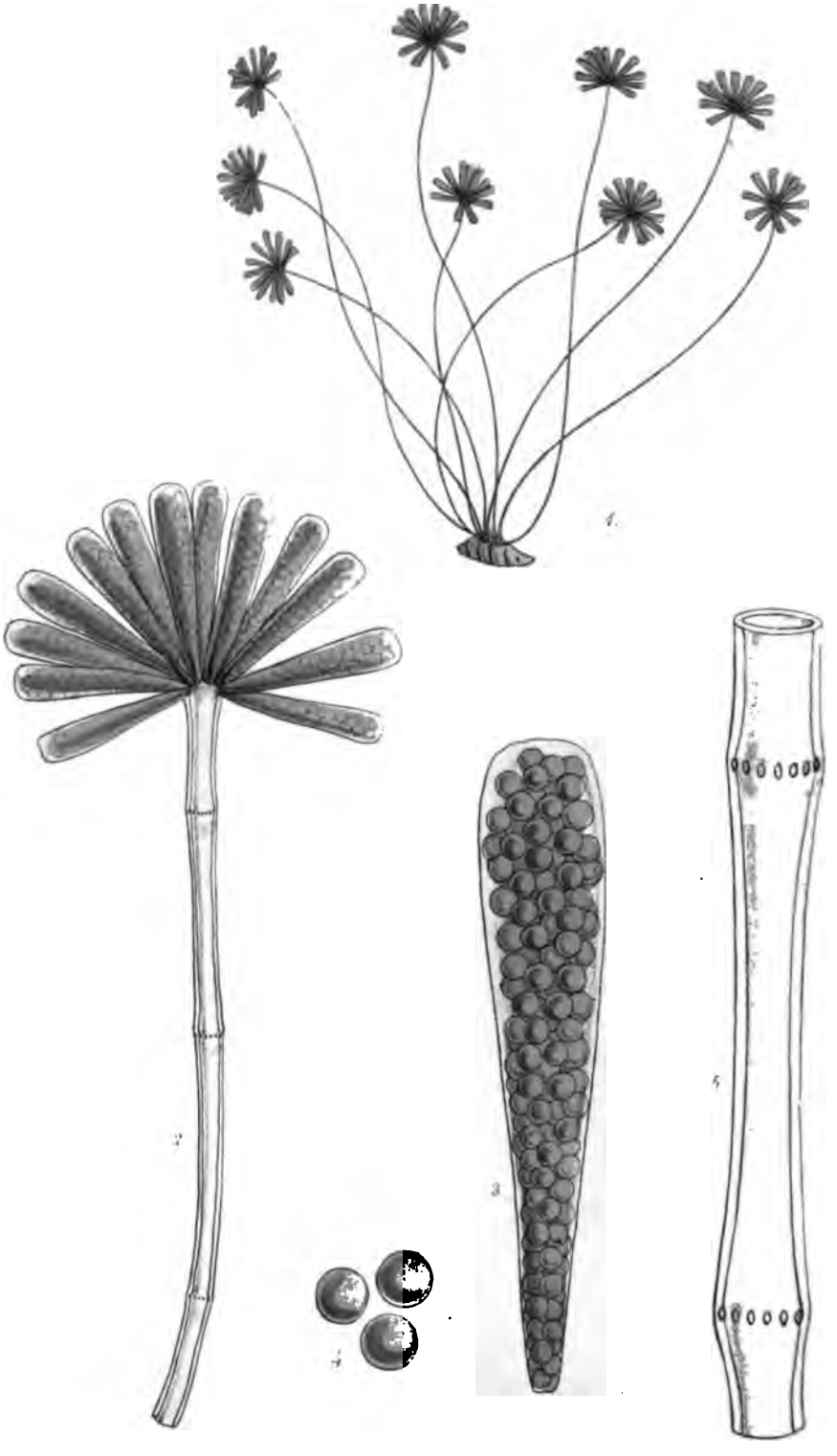

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PLATE CCLV.

POLYPHYSA CLIFTONI, *Harv.*

GEN. CHAR. *Root* scutulate. *Frond* pencil-like. *Stipes* cylindrical, unicellular, nodulose, crowned with a tuft of obovoid, saccate, unicellular ramuli, filled with grumous endochrome. *Spores* spherical, formed out of the contents of the ramuli.—POLYPHYSA (*Lamarck*), from πολυ, *many*, and φυσα, *a sac.*

Radix scutata. Frons penicilliformis. Stipes cylindraceus, unicellulosus, nodosus, apice ramulis vesicæformibus obovoideis membranaceis succo grumoso repletis coronatus. Sporæ globosæ, perisporio hyalino rigide membranaceo donatæ, ex succo ramulorum demum evolutæ.

POLYPHYSA *Cliftoni;* stipes membranaceous, filiform; ramuli very narrow, club-shaped.

P. Cliftoni; *stipite membranaceo filiformi; ramulis anguste clavæformibus.*

POLYPHYSA Cliftoni, *Harv. supra, sub Tab. nostr. XI.*

HAB. Fremantle, Western Australia, *G. Clifton,* 1857.

GEOGR. DISTR. Western Australia.

DESCR. *Root* a small disc. *Fronds* tufted. Stipes 2–3 inches long, capillary, membranaceous or very thinly coated with carbonate of lime, distantly nodulose, the nodes not much swollen, pierced with minute holes. *Ramuli* 10–12, linear-cuneiform, about eight times as long as their greatest diameter, obtuse, at first filled with bright-green grumous matter; when mature, filled with spores. *Spores* spherical, with a tough hyaline perispore and full-green granular contents. The *colour* of the stipes is a very pale, of the ramuli a full grass-green The *substance* is softer and more flaccid than in *P. Peniculus,* but the frond scarcely adheres to paper in drying.

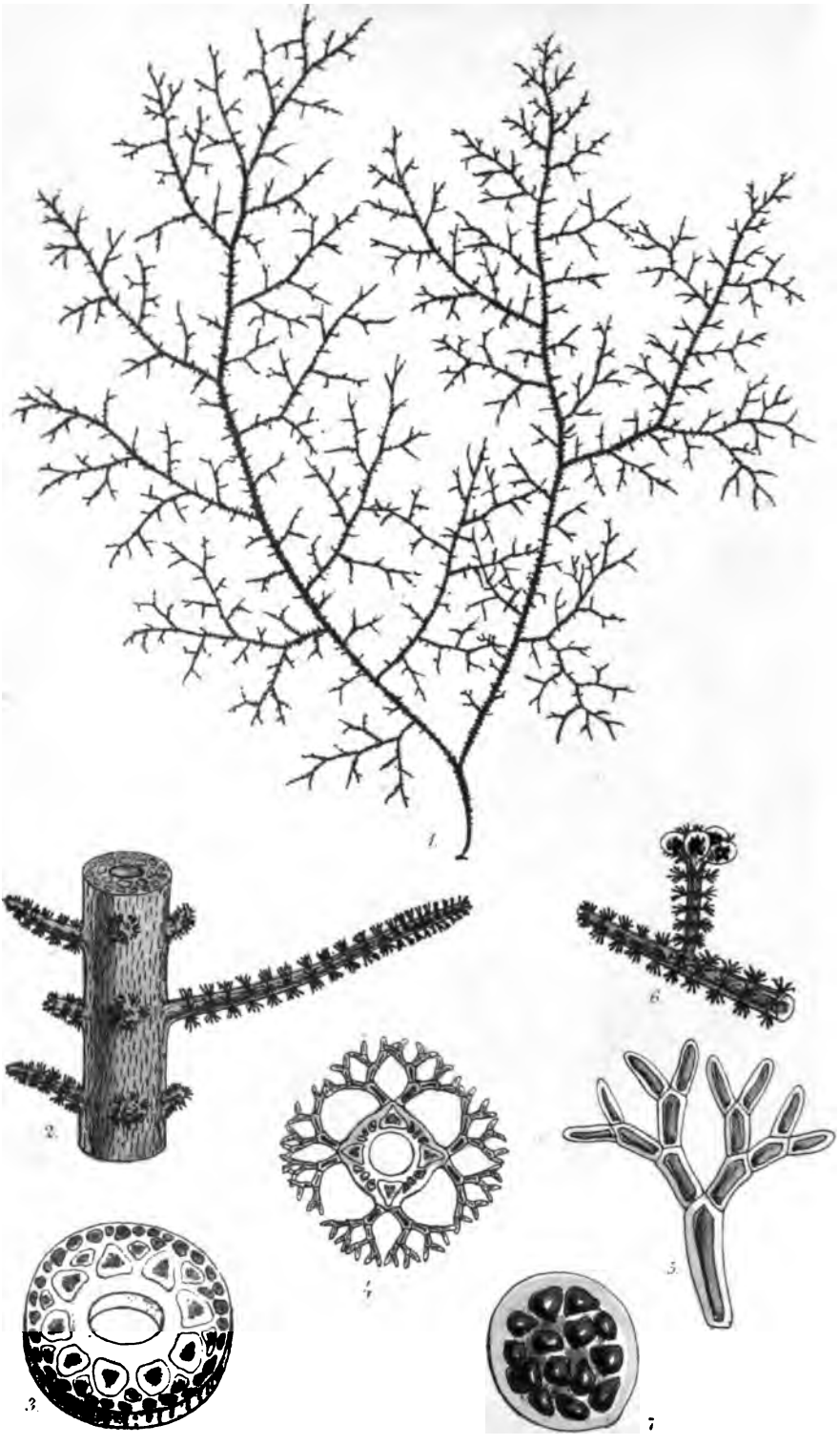
In our first volume, under *Polyphysa Peniculus* (Plate XI.), I named the present species and gave a brief description of it. I now complete its history, so far as I am able, by adding a figure and correcting a misstatement made from imperfect observation in the place above referred to. I had characterized it "*nodis imperforatis.*" A more careful examination has revealed the

whorl of pores or scars, similar to those found in *P. Peniculus*, but smaller. The differences, therefore, between our present plant and the older species are now limited to the shape of the ramuli, the more distant and less swollen nodes of the stem, and the more membranous substance.

As far as I know, this species was only once dredged by Mr. Clifton, in 1857. It would seem therefore to be of very rare occurrence.

I take this opportunity of stating that *P. Peniculus* has been found in profusion by Dr. Mueller at the Heads of Port Philip. Previously it had not been known to the eastward of Port Lincoln; nor have I myself collected it, except at King George's Sound.

Fig. 1. POLYPHYSA CLIFTONI,—*the natural size.* 2. Apex of a frond. 3. One of the ramuli, with ripe spores. 4. Spores removed. 5. Portion of the stipes, showing perforations at the nodes:—the latter figures *magnified.*



Vincent Brooks, Imp.

PLATE CCLVI.

CROUANIA AGARDHIANA, *Harv.*

GEN. CHAR. *Frond* nodoso-articulate, alternately decompound, consisting of an articulate, monosiphonous, primary filament (or *axis*) emitting at the nodes densely whorled, minute, dichotomo-fastigiate, free, articulated ramelli. *Fructification:* 1, solitary subterminal *favellæ*, surrounded by ramelli; 2, external triangularly-parted *tetraspores*, borne on the ramelli.—CROUANIA (*J. Ag.*), in honour of the brothers *Crouan*, of Brest, celebrated among French Phycologists.

Frons nodoso-articulata, alterne decomposita, e filo primario (axi) monosiphonio articulato ramellos minutissimos dichotomo-fastigiatos articulatos verticillatos ex nodis emittente constituta. Fruct.: 1, *favellæ subterminales, solitariæ, inter ramellos absconditæ;* 2, *tetrasporæ triangule aut transversim divisæ, ad ramellos lateraliter affixæ.*

CROUANIA *Agardhiana;* frond cartilaginous (6–8 inches long), thickly corticated throughout, opaque, decompoundly much branched; branches and ramuli alternate or scattered, repeatedly divided, very patent, whorled at the nodes with minute, dichotomo-multifid, 4-ranked, articulated obtuse ramelli; articulations of the ramelli 2–3 times as long as broad; favellæ quaternate, at the apices of short branches.

C. Agardhiana; *fronde cartilaginea* (6–8-*unciali*) *strato cellularum crasso-corticata opaca decomposite ramosissima; ramis ramulisque alternis v. sparsis repetite divisis patentissimis ad genicula verticillatim ramellosis, ramellis minutis articulatis tetrastichis dichotomo-multifidis obtusis, articulis ramellorum diametro* 2–3-*plo longioribus; favellis quaternis ramos breves coronantibus.*

CROUANIA Agardhiana, *Harv. Alg. Austr. Exsic. n.* 487.

WRANGELIA? Agardhiana, *Harv. in Trans. R. I. Acad. v.* 22. *p.* 545.

HAB. King George's Sound, *W. H. H.*

GEOGR. DISTR. South-west coast of New Holland.

DESCR. *Root* a small disc. *Frond* 6–8 inches long, as thick as hog's bristle, coated in all parts with a layer of peripheric cells, which in the younger parts are in a single row, in the older in 3–4 rows, surrounding the monosiphonous articulated axial tube. The frond is decompoundly much branched in an alternate or irregular manner, the branches and ramuli directed to all sides and spreading at very wide angles, the lesser ones divaricating; the ultimate ones very short, and either opposite or quaternate. The *internodes* throughout the frond are about $1\frac{1}{2}$-twice as long as broad. The *nodes* are

everywhere whorled with quaternate ramelli. These *ramelli* are minute, ½ line long, articulated, biparted to the base, each division 3–4 times dichotomous, with blunt apices. The *articulations* are 2–3 times as long as broad. *Favellæ* mostly 4 together, at the ends of abbreviated ramuli, each containing several angular spores in a hyaline periderm. *Tetraspores* not observed. *Colour* a full red, becoming browner in drying. The *substance* is cartilaginous, much firmer and less gelatinous than in others of the genus. In drying, the frond closely adheres to paper.

This plant so perfectly agrees in habit and in fructification, so far as this is yet known, with other species of *Crouania*, that I think it can hardly be naturally placed in any other genus. But it differs from all known species by having its stem and branches coated with a layer of cellular tissue, so as completely to conceal the articulated primary filament. We have, however, in *Callithamnion*, in *Wrangelia*, and in other genera with articulated fronds some species with coated and some with nude filaments; and why not also in *Crouania?*

In external habit, *C. Agardhiana* most resembles *C. insignis*, but is of smaller size, more divaricated in ramification, and less gelatinous in substance. I have named it in compliment to my friend Prof. J. Agardh, the founder of the genus *Crouania;* a genus which, though founded, like *Wrangelia*, on a single Mediterranean species, is more developed in Australia than on any other coast.

Fig. 1. CROUANIA AGARDHIANA,—*the natural size.* Fig. 2. Fragment of a branch, with branchlets. 3. Transverse section of a branch. 4. Transverse section of a ramulus, with 4-ranked ramelli. 5. A ramellus. 6. Short branch, bearing favellæ. 7. A favella:—the latter figures *magnified.*

Vincent Brooks Imp.

PLATE CCLVII.

DASYA TENERA, *Harv.*

GEN. CHAR. *Frond* filiform or compressed, dendroid; stem and branches coated with small, polygonal cells (rarely articulated, and many-tubed); the axis articulate, composed of several radiating cells surrounding a central cavity; ramelli articulated, one-tubed. *Fructification:* 1, ovate or urceolate *ceramidia;* 2, lanceolate *stichidia,* attached to the ramelli, and containing triangularly-parted tetraspores in transverse rows.—DASYA (*Ag.*), from δασυς, *hairy.*

Frons filiformis v. compressa, dendroidea. Caulis ramique majores strato cellularum corticati (raro pellucide articulati), ramellis monosiphoniis obsessi; axis articulatus, ex cellulis pluribus radiantibus tubum centralem cingentibus formatus. Fruct.: 1, *ceramidia ovata v. urceolata;* 2, *stichidia lanceolata, ex ramellis enata, tetrasporas transversim ordinatas foventia.*

DASYA *tenera;* cartilaginous when fresh, but almost instantly softening, rosy when dry; frond 4-tubed, corticated, decompoundly much branched, subdichotomous, flexuous; branches irregularly divided, the smaller ones often secund, the ultimate much attenuated, acute, all naked or laxly covered with very slender ramelli; ramelli whorled, branched at base, subsimple, straight, cylindrical, obtuse; ceramidia ovate, pedicellate; stichidia scattered or tufted, lanceolate, formed on the ramuli.

D. tenera; *cartilaginea, mox aere deliquescens, siccitate rosea; fronde tetrasiphonia corticata decomposite ramosissima subdichotoma flexuosa; ramis irregulariter divisis, minoribus sæpe secundis, ultimis attenuatis acutis, omnibus denudatis v. ramellis tenuissimis laxe vestitis; ramellis verticillatis basi ramosis simpliciusculis strictis cylindraceis obtusis; ceramidiis ovatis pedicellatis; stichidiis sparsis v. fasciculatis lanceolatis e ramulis enatis.*

DASYA tenera, *Harv. in Trans. R. I. Acad. v.* 22. *p.* 543. *Alg. Austr. Exsic. No.* 209.

HAB. Thrown up from deep water. Very abundant at Fremantle and in King George's Sound, West Australia. Also at Port Philip, Victoria.

GEOGR. DISTR. West and south coasts of New Holland.

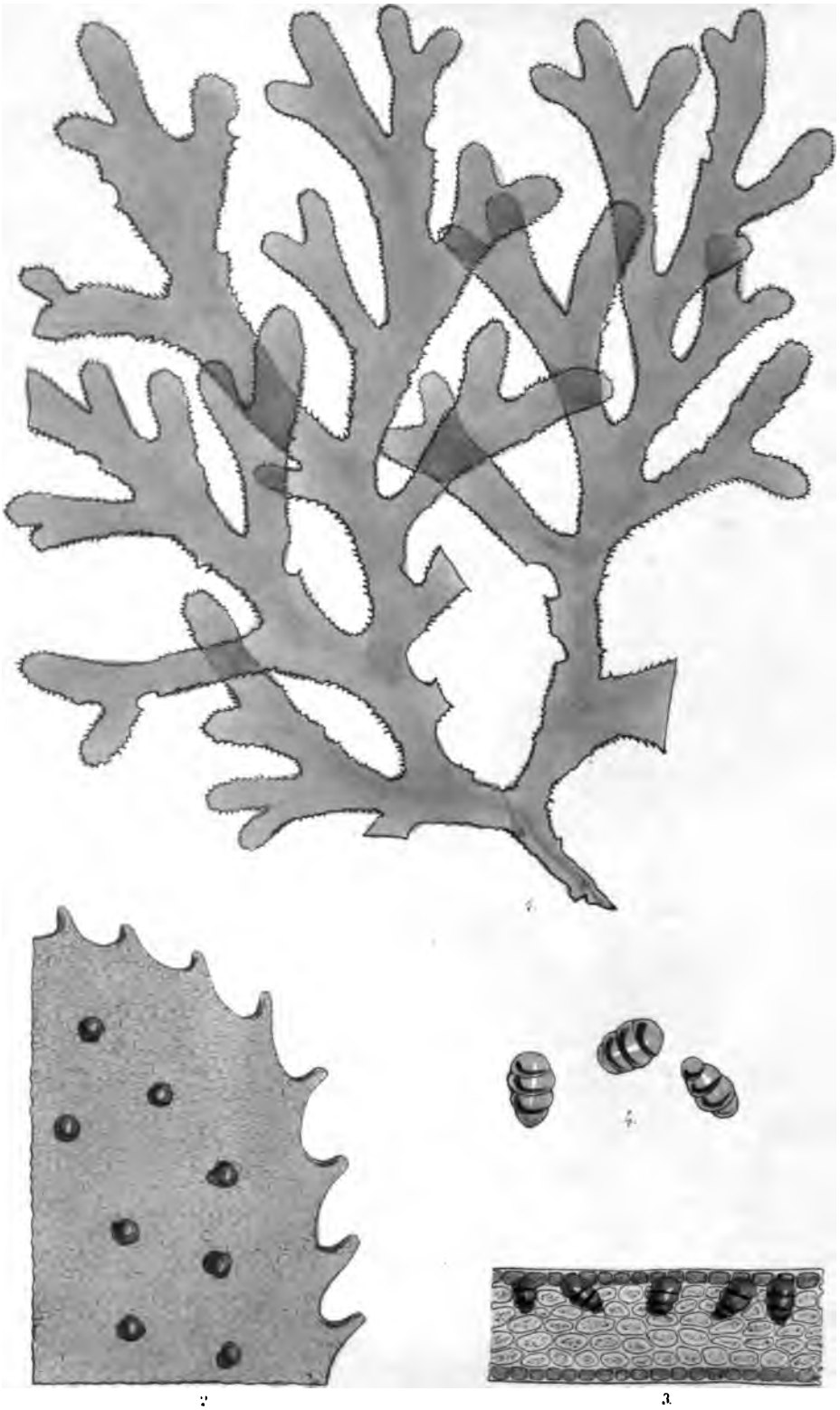
DESCR. *Root* a small disc. This forms large, globose, tufts, 6–12 inches or more in diameter. *Fronds* 6–12 inches long, varying from ¼ line to a line or rather more in diameter, excessively branched in an irregularly dichotomous or alternately decompound manner, the lesser divisions frequently secund. The branches are directed towards all sides, and spread at wide angles; they taper much towards the extremities, and the smaller

ones are attenuated to a fine point. The frond in every part is thickly coated with cellules, so as to appear inarticulate, and the larger branches as well as the older parts of full-grown fronds are bare of ramelli. All the young branches, while growth continues, are thinly clothed with very slender, soft, fugacious subsimple ramelli. *Fruit* of both kinds is commonly produced. The *ceramidia* are ovate, borne on larger or shorter inarticulate pedicels issuing from the sides of the branches, often in secund order. The *stichidia* are similarly placed and pedicellated, and lanceolate in form. The *colour*, when the plant is quite fresh, is a pale testaceous brown, but soon after gathering it changes to a brilliant rosy-red, which is retained in drying. The *substance*, at first cartilaginous, almost instantly softens in the air, and decomposes into jelly on immersion in fresh water. In drying the frond unites itself most closely with paper.

This species, though profusely common on several parts of the Australian coast, has only very recently attracted the notice of collectors. Nor is this to be wondered at, because it is of so perishable a nature as to be dried with difficulty; and even when most skilfully prepared, the half-dissolved specimens become so incorporated with the paper on which they are displayed, as to be of little use for microscopic examination. Having neglected to make a sketch of the anatomical character of the living plant, I have been unable to supply the deficiency from the dry, as remoistening the stem causes it instantly to dissolve.

The remarkable change of colour, from pale-brown to brilliant rose-red, which takes place in this species on removal from the sea, is mentioned in our description. A similar change occurs under similar circumstances in all the species of *Sarcomenia*, in *Polysiphonia mutabilis*. At the same time the substance softens in all these plants, and decay rapidly ensues.

Fig. 1. DASYA TENERA,—*the natural size.* 2. Fragment of a branch, bearing ceramidia. 3. Spores. 4. Apex of a branch, with *stichidia* and ramelli. 5. A tetraspore :—the latter figures *magnified.*



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Vincent Brooks Imp.

PLATE CCLVIII.

RHODOPHYLLIS? NITOPHYLLOIDES, *Harv.*

GEN. CHAR. *Frond* flat, membranous, dichotomously or pinnately decompound, mostly margined with leafy or slender processes, and composed of two strata of cells; the medullary stratum formed of roundish-angular cells, the cortical of coloured cellules in one or few rows. *Fructification:* 1, marginal, external conceptacles, containing within a pericarp formed of radiating filaments, a compound nucleus, formed of bundles of spore-threads radiating from a basal (or central) placenta; 2, zonate *tetraspores,* immersed in the peripheric cells of the segments or marginal processes.—RHODOPHYLLIS (*Kütz.*), from ῥοδεος, *red,* and φυλλον, *a leaf.*

Frons plana, membranacea, dichotome v. pinnatim decomposita, segmentisque ciliisve marginalibus obsita, stratis duobus contexta; strato medullari cellulis rotundato-angulatis, corticali cellulis coloratis uni- v. pauci-seriatis composito. Fruct.: 1, *cystocarpia marginalia, externa, pericarpio filis moniliformibus radiantibus conflato munita, nucleum compositum ex fasciculis filorum radiantium formatum foventia; filis demum in sporas solutis;* 2, *tetrasporæ zonatim divisæ, fronde v. lacinulis marginalibus immersæ.*

RHODOPHYLLIS? *nitophylloides;* frond rigidly membranous, flabelliform, irregularly dichotomo-multifid; laciniæ broadly linear, patent, obtuse, ciliato-dentate; tetraspores immersed in the superficial cells, scattered over the whole frond.

R.? nitophylloides; *fronde rigidiuscule membranacea flabelliformi irregulariter dichotomo-multifida; laciniis lato-linearibus patentibus obtusis margine ciliato-dentatis; tetrasporis (zonatim divisis) inter cellulas superficiales immersis, per totam frondem sparsis.*

NOV. GEN.? *Harv. in Trans. R. I. Acad. v.* 22. *p.* 549. *No.* 184. *Alg. Austr. Exsic. No.* 285.

STICTOSPORUM dentatum, *Harv. MSS. in Herb. T. C. D.*

CALLIBLEPHARIS? nitophylloides, *Harv. MSS. in Herb. T. C. D.*

HAB. Garden Island, W. Australia, *W. H. H., G. Clifton.*

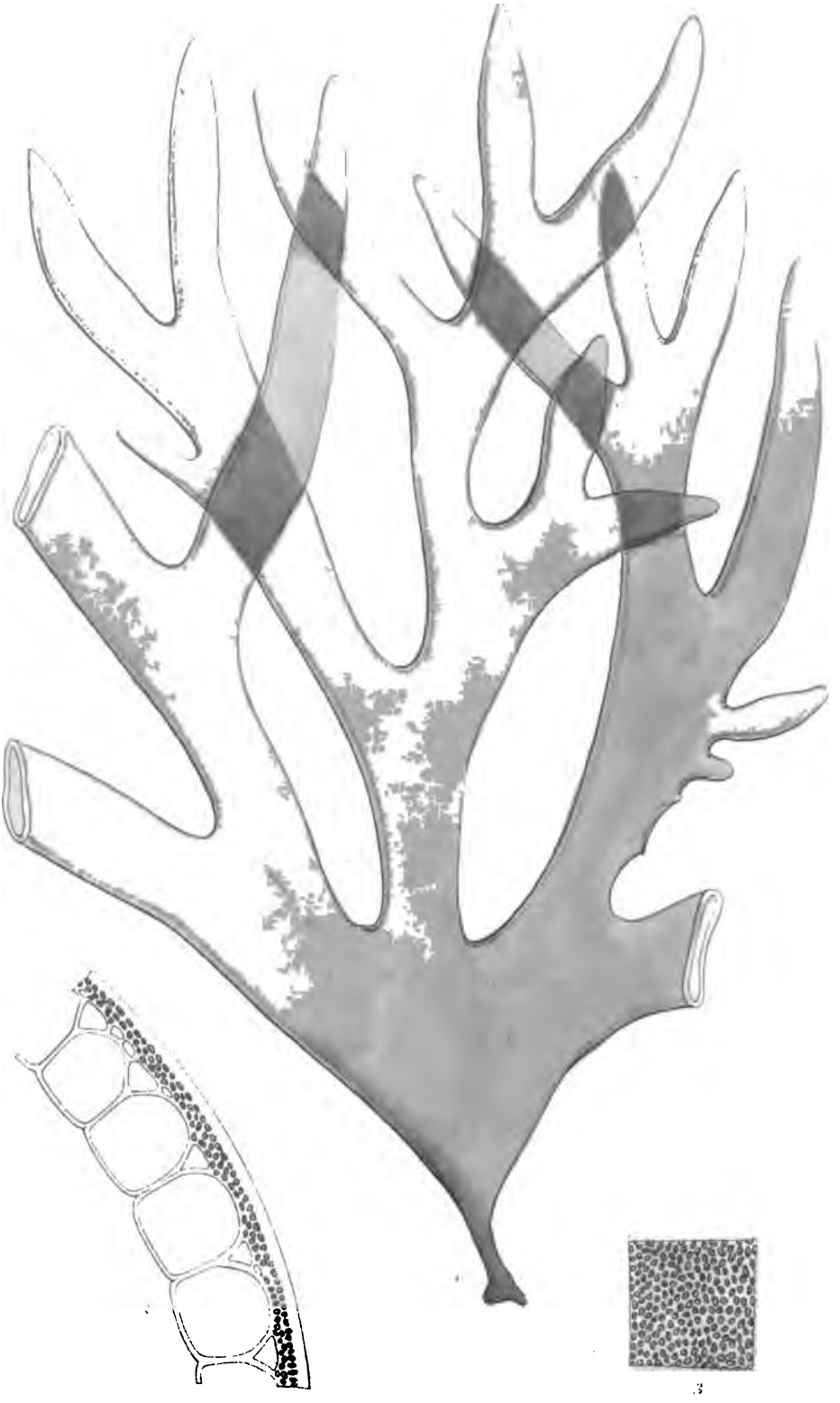
GEOGR. DISTR. West coast of Australia.

DESCR. *Frond* 6–8 inches long and as much or more in the expansion of the divisions, from the base divided into many, irregularly dichotomous or multifid, spreading laciniæ, all the axils very wide and rounded. *Laciniæ* from quarter to half inch broad, or more, nearly linear throughout, the wider

ones somewhat cuneate below the furcations, all very obtuse or round-topped; the margin throughout sharply and coarsely toothed, or in places ciliato-dentate. *Cystocarpic* fruit not known. *Tetraspores* of large size, and deep-red colour, immersed or half immersed in the cellules (chiefly) of the upper surface, and scattered abundantly over every part of the frond, appearing like dots under a pocket lens. The *colour*, when recent, is a full rosy-red, becoming duller and more purple in the herbarium. The *substance* is very firmly membranous or somewhat cartilaginous; and when dry the frond shrinks considerably, and very imperfectly adheres to paper. The superficial cellules are of larger size than in other species of *Rhodophyllis*, and in a single row; those of the medullary stratum are smaller, more closely packed and filled with granular coloured matter.

I am not at all sure that the plant here figured is correctly referred to *Rhodophyllis*, in which genus I place it provisionally, until the discovery of the *cystocarps* enables us to determine its true affinities. The *structure* of the frond does not quite agree with that of *Rhodophyllis*, and perhaps agrees better with that of *Calliblepharis*. The *tetrasporic* fruit would answer equally well for either of these genera. In habit there is a greater resemblance to *Rhodophyllis*, and this has induced me to place it in that genus. Taking into consideration the structure of the frond, and the remarkably large and distantly scattered tetraspores, I had at one time supposed it might be the type of a peculiar genus; but without a knowledge of the *cystocarps* it would be premature so to consider it.

Fig. 1. RHODOPHYLLIS? NITOPHYLLOIDES,—*the natural size.* 2. Small portion of a lacinia, with scattered tetraspores *in situ.* 3. Section through a portion of the same. 4. Tetraspores:—*all magnified.*



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[illegible] Imp.

PLATE CCLIX.

GLOIOSACCION? DIGITATUM, *Harv.*

GEN. CHAR. *Frond* bag-like, filled with transparent gelatine, membranaceous, composed of three strata; the *medullary* stratum of very large gelatinous cells, soon ruptured; the *intermediate* of roundish-angular, coloured cells; the *cortical* of minute cellules set in vertical filaments. *Fructification:* 1, globose *favellidia* immersed in the cells of the intermediate stratum, and composed of numerous confluent nucleoli; 2, *tetraspores* (not known)?—GLOIOSACCION (*Harv.*), from γλοιος, *viscid*, and σακκος, *a bag* or *sack*.

Frons sacciformis, succo gelatinoso hyalino repleta, membranacea, stratis fere tribus contexta; strato medullari cellulis maximis gelatinosis cito ruptis, intermedio cellulis rotundato-angulatis coloratis, corticali cellulis minimis in fila verticalia ordinatis constante. Fruct.: 1, *favellidia globosa, in strato intermedio immersa, nucleolis pluribus confluentibus composita;* 2, *tetrasporæ?*

GLOIOSACCION *digitatum;* frond shortly stipitate, plano-compressed, palmato-multifid, fastigiate; laciniæ subdichotomous, with wide rounded axils, tapering to an obtuse point.

G. digitatum; *fronde breve stipitata plano-compressa palmato-multifida fastigiata, laciniis subdichotomis, superioribus lanceolatis obtusis, axillis rotundatis.*

HALYMENIA? digitata, *Harv. Alg. Austr. Exsic. No.* 436.

HAB. Dredged in Port Jackson, *C. Moore, W. H. H.*

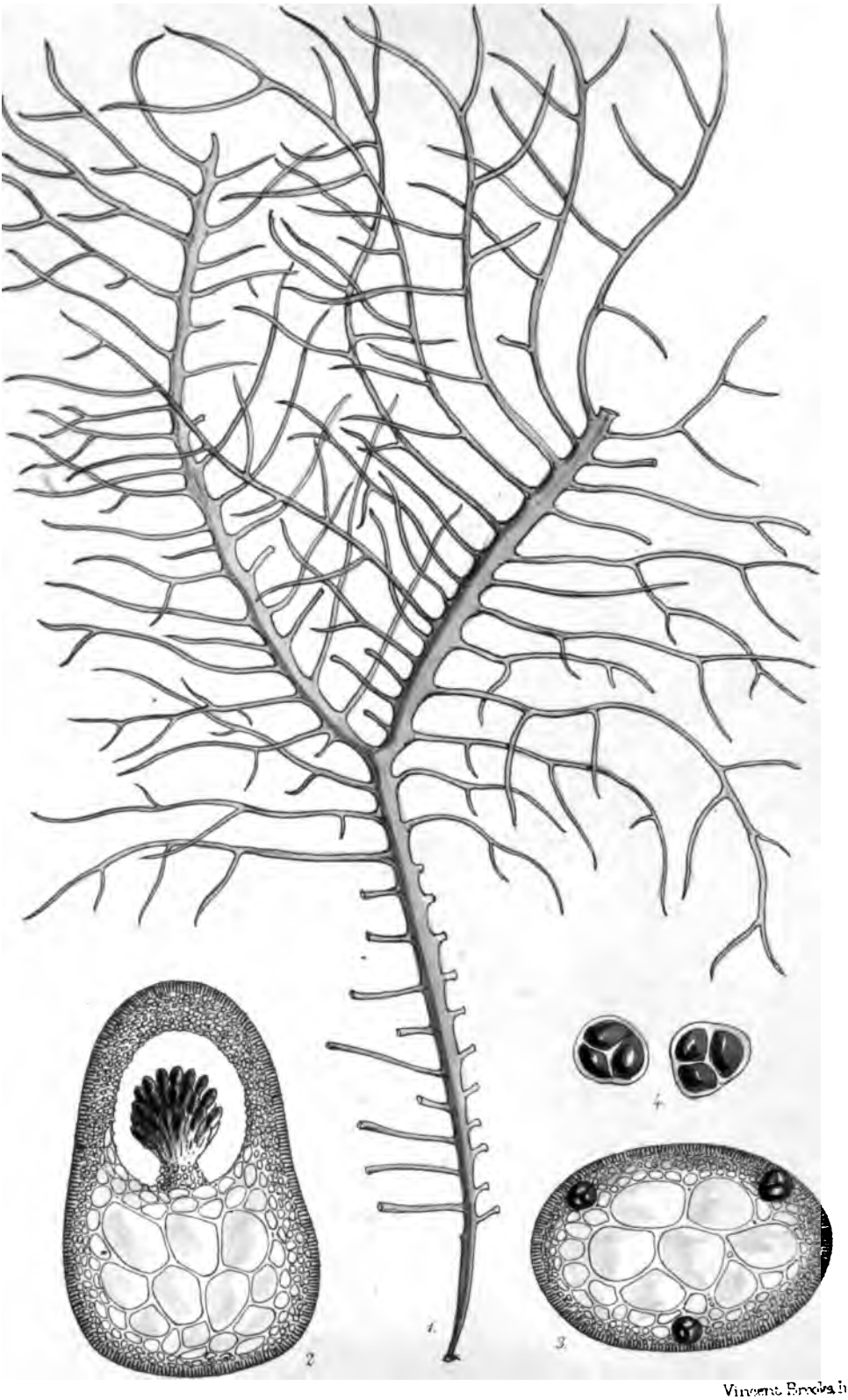
GEOGR. DISTR. East coast of New Holland.

DESCR. *Root* a small disc, 2–3 lines in diameter. *Frond* 6–12 inches long, or more, and as fully much in the expansion of the laciniæ, broadly cuneate or flabelliform at base, but deeply divided palmately into 4–5 principal segments, which are twice or thrice dichotomous or irregularly multifid. The whole frond is strongly compressed, or nearly plane, and the laciniæ have an average width of about 1 inch or 1½ inches in full-grown specimens. The axils in all parts are wide and rounded; the lower laciniæ are broadly linear-cuneate, the uppermost more or less lanceolate, tapering to an obtuse or subacute point. No fruit has been observed. The *colour* is a rosy-red, which is soon discharged in fresh water. The *substance* is gelatinoso-membranaceous, and in drying the frond adheres most closely to paper.

In habit this species resembles several species of *Halymenia*, to which genus I formerly referred it; but the structure of the frond, if my analysis (made from dried specimens) be correct, forbids our regarding it as a *Halymenia*. In habit also there is a striking resemblance with *Nemastoma palmata*, shortly to be figured in this work, but the structure is even more unlike. No fruit has yet been observed, and consequently the genus cannot be absolutely determined. But as the structure of the frond agrees tolerably well with that of *Gloiosaccion*, I am induced, notwithstanding some difference in habit, to place this plant provisionally in *Gloiosaccion*. The difference in habit is not so great as appears; for though *Gl. Brownii* (Tab. LXXXIII.) is most usually quite simple and baglike, yet it sometimes occurs with once or twice *forked* fronds, showing that an unbranched habit is not essential, even as a specific character.

Fig. 1. GLOIOSACCION DIGITATUM,—*the natural size.* 2. Section through a portion of the wall of the tubular frond. 3. Vertical view of the peripheric cells:—*magnified.*

Plate CCII.



Vincent Brooks lith

PLATE CCLX.

GRACILARIA RAMALINA, *Harv.*

GEN. CHAR. *Frond* filiform, compressed, or flat, cartilaginous, irregularly branched, composed of two strata; the medullary stratum of large, roundish, angular cells, smaller outwards, usually containing granules; the cortical of minute cellules, vertically seriated or in a single row. *Fructification:* 1, hemispherical or conoidal conceptacles, sessile on the branches, containing within a thick pericarp ovate *spores* arranged in spore-threads issuing from a basal placenta; 2, *tetraspores* cruciate or tripartite, dispersed among the surface-cellules of the branches and ramuli.—GRACILARIA (*Grev.*), from *gracilis*, 'slender;' applicable to the filiform species.

Frons filiformis, compressa, v. plana, carnoso-cartilaginea, vage ramosa, ex stratis duobus contexta. Stratum medullare cellulis magnis rotundato-angulatis, exterioribus sensim minoribus, materie granulosa sæpe repletis; corticale cellulis minimis uni- v. pluri-seriatis, Fruct.: 1, *conceptacula hemisphærica, sessilia, intra pericarpium crassum fila sporifera e placenta basali radiantia foventia;* 2, *tetrasporæ sparsæ, cruciatim divisæ.*

GRACILARIA *Ramalina;* frond rosy or pale, plano-compressed, distichous, decompoundly subbipinnate; pinnæ and pinnules horizontally patent, opposite or alternate, the pinnules filiform, very long, divaricate, acute; cystocarps conical, lateral, often secund; tetraspores scattered.

G. Ramalina; *fronde rosea v. pallida plano-compressa disticha, decomposite subbipinnata, pinnis pinnulisque horizontaliter patentibus oppositis alternisque, pinnulis filiformibus longissimis divaricatis acutis, cystocarpiis conoideis lateralibus sæpius secundis, tetrasporis sparsis.*

HYMENOCLADIA Ramalina, *Harv. in Trans. R. I. Acad. v.* 22. *p.* 553. *Harv. Alg. Austr. No.* 321.

HAB. King George's Sound, *W. H. H.*

GEOGR. DISTR. South-west of New Holland.

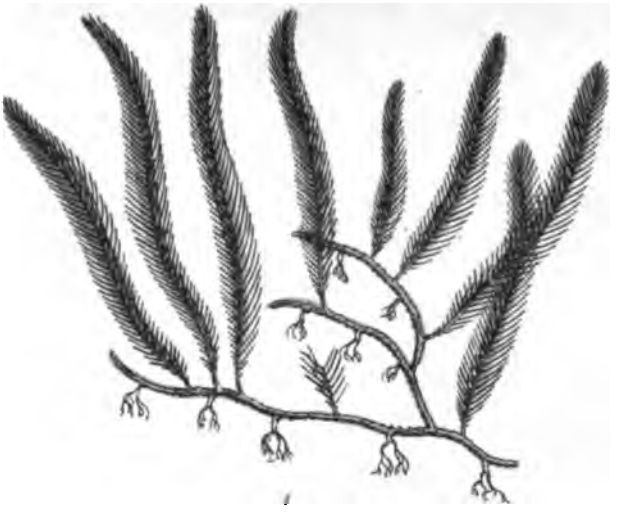
DESCR. *Root* discoid. *Frond* 12 inches long, or more, and as much in the expansion of the branches. The main stem is either simple or once forked, 2–3 lines wide, and very strongly compressed, or nearly flat. It is set throughout its length with distichous, very patent or divaricate, lateral branches and branchlets, closely placed, often only 1–2 lines apart, and of various lengths intermixed. The larger, or *pinnæ*, are 2–6 inches long, flattened like the main stem, and closely pinnulated once or twice. The smaller are linear-filiform, simple, or here and there ramuliferous, or sometimes pinnulated. The apices are acute. *Cystocarps* prominent, conical,

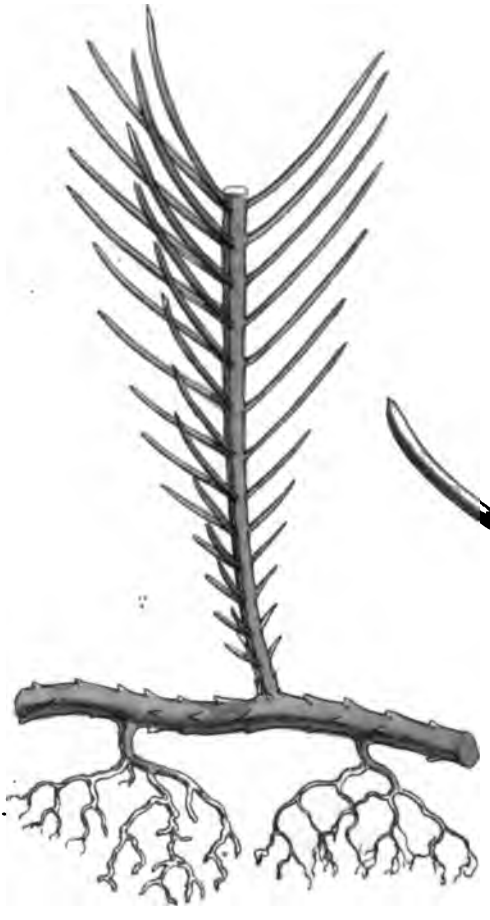
scattered along the branches, which are then frequently flexuous or geniculate, often secund. *Tetraspores* scattered in ramuli. *Colour* a rosy but fugacious red, sometimes becoming browner in the herbarium. *Substance* cartilagineo-membranaceous, shrinking in drying, in which state the frond adheres pretty firmly to paper.

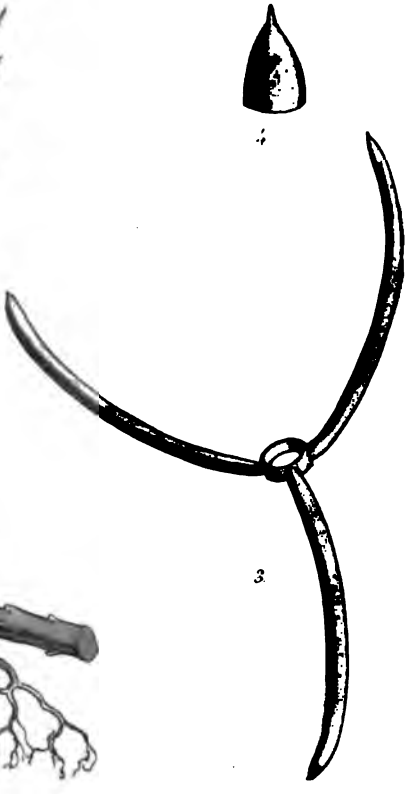
This plant is sometimes more ramulous than represented in the figure, and it varies also in colour, from a brilliant to a very pale red. Formerly I described and distributed the more ramuliferous and bright-coloured but barren specimens, under the name *Hymenocladia Ramalina ;* whilst many of the less-branched and paler specimens became mixed with duplicates of *Gracilaria dactyloides,* and have, I fear, been partly distributed under that name. It is these specimens which are referred to in the description of *G. dactyloides* (Tab. LXXX.), as differing in ramification from other examples of that species. A more careful examination now leads me to refer these specimens, some of which are in fruit, to what I had formerly placed, incorrectly, in *Hymenocladia,* and to found the present species upon them unitedly.

Our *G. Ramalina* seems to approach nearest to *G. Domingensis,* Sond., a West Indian species.

Fig. 1. GRACILARIA RAMALINA,—*the natural size.* 2. Section through a ramulus and cystocarp. 3. Section through a ramulus, with immersed tetraspores. 4. Tetraspores :—the latter figures *magnified.*







Vincent Brooks, Imp.

PLATE CCLXI.

CAULERPA TRIFARIA, *Harv.*

GEN. CHAR. *Frond* consisting of prostrate surculi, rooting from their lower surface, and throwing up erect branches (or secondary fronds) of various shapes. *Substance* horny-membranous, destitute of calcareous matter. *Structure* unicellular, the cell continuous, strengthened internally by a spongy network of anastomosing filaments, and filled with semifluid, grumous matter. *Fructification* unknown.—CAULERPA (*Lamx.*), from καυλος, *a stem*, and ἑρπω, *to creep.*

Frons ex surculis prostratis hic illic radicantibus et ramis erectis polymorphis formata. Substantia corneo-membranacea. Structura unicellulosa, cellulæ membrana continua hyalina intus filis cartilagineis tenuissimis anastomosantibus firmata et endochromate denso viridi repleta. Fr. ignota.

CAULERPA *trifaria;* surculus slender, thinly sprinkled with sharp points; fronds erect, simple, closely whorled with trifarious, setaceous, subacute, incurved ramenta.

C. trifaria; *surculo tenui hic illic sparsim echinulato, fronde erecta simplici ramentis trifariis setaceis acutiusculis incurvis crebre verticillata.*

HAB. Creeping on sand-covered rocks, in tidepools. Port Philip Heads, rare, *W. H. H.*

GEOGR. DISTR. South coast of Australia.

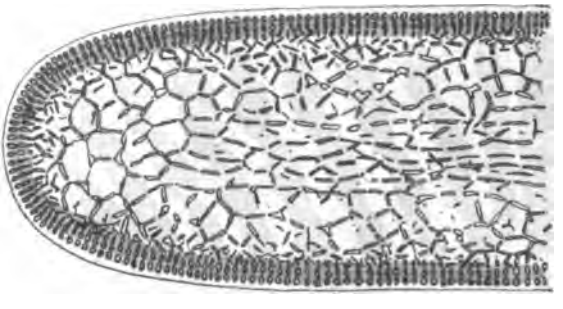
DESCR. *Surculus* 2–4 inches long, about half a line in diameter, simple or branched, copiously rooting, thinly beset with short, scattered or trifarious, sharp points, throwing up from its upper surface numerous erect fronds. *Fronds* 1–2–3 inches long, sessile or minutely stipitate, linear or linear-lanceolate, closely whorled throughout with trifarious ramenta; those near the base of the rachis much shorter than the rest, the lowermost dwindling into prickles. *Ramenta* setaceous, slightly incurved, cylindrical, subacute or mucronulate. *Colour* rather a dark green, paler towards the extremities. *Substance* membranaceous. In drying it imperfectly adheres to paper.

This pretty little species is not very like any other Australian *Caulerpa,* but has so greatly the aspect of *C. plumaris,* Ag., a native of the tropical ocean, that without a close examination, it might be mistaken for that plant. It however differs essentially

from *C. plumaris*, as well by its trifarious, not distichous, ramenta, as by the prominent, sharp points or aculei that roughen its surculus. The nearest affinity, among Australian species, seems to be with *C. Harveyi*, from which it differs in the rough surculus, and the trifarious, not five-ranked, and comparatively much shorter ramenta.

C. trifaria appears to be rare; I collected but few specimens at Port Philip Heads, and have not yet received it from Dr. Müller, or any other Victorian botanist.

Fig. 1. CAULERPA TRIFARIA,—*the natural size.* 2. Portion of the surculus, and of the base of a frond. 3. Section through a frond. 4. Apex of one of the ramenta :—*magnified.*



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Vincent Brooks, Imp.

PLATE CCLXII.

NEMASTOMA? PALMATA, *Harv.*

GEN. CHAR. *Frond* compressed or flattened, between fleshy and gelatinous, dichotomous or subpinnate, composed of two strata; the medullary stratum formed of longitudinal, interwoven, subsimple filaments, the peripheric of excurrent, dichotomo-fastigiate, articulate filaments, moniliform toward the apices, and lying in lax or firm gelatine. *Fructification:* 1, *favellæ* immersed below the cortical filaments, containing within a gelatinous periderm numerous roundish spores; 2, cruciate *tetraspores* dispersed among the cortical filaments.—NEMASTOMA* (*J. Ag.*), from *νημα, a thread,* and perhaps *ιστημι,* in its sense of *to strengthen,* or *stand fast?*

Frons compresso-plana, gelatinoso-carnosa, dichotoma v. vage pinnata, duplici strato constituta; strato medullari filis longitudinalibus simpliciusculis intertextis, peripherico filis excurrenti-verticalibus dichotomo-fastigiatis articulatis apicem versus moniliformibus, muco laxiori v. solidescente cohibitis contexto. Fruct.: 1, *favellæ simplices, infra fila peripherica immersæ;* 2, *tetrasporæ cruciatim divisæ, sparsæ, intra fila moniliformia nidulantes.*

NEMASTOMA *palmata;* frond membranaceous, thickish, irregularly palmatifid or subdichotomous; laciniæ lanceolate-linear, subacute, spreading; medullary tissue very lax.

N. palmata; *fronde membranacea crassiuscula vage palmatifida v. irregulariter furcata, laciniis lanceolato-linearibus acutiusculis patentibus; filis medullaribus laxe intertextis.*

HAB. Coast of Tasmania, rare, *Miss Browne.*

GEOGR. DISTR. Tasmania.

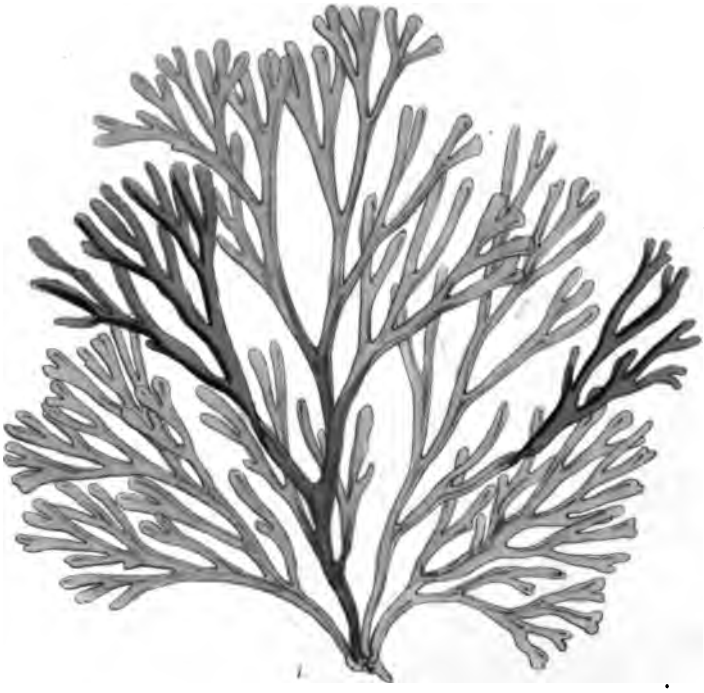
DESCR. *Root* a small, scutate disc. *Frond* 4–6 inches (perhaps more) in height, and as much in the expansion of its lobes, deeply divided, in an irregularly-palmate manner into several principal segments; each of these is again subdivided into numerous, spreading laciniæ. *Laciniæ* broadly linear or somewhat lanceolate, 4–5 lines wide, tapering gradually to a subacute point, not contracted at the base, simple or bifid. No *fruit* has been observed. The *medullary* stratum is composed of very loosely interwoven anastomosing filaments, separated by rather fluid, hyaline jelly; the *cortical* layer, of closely-placed, moniliform, coloured, vertical filaments. The *colour* of the frond,

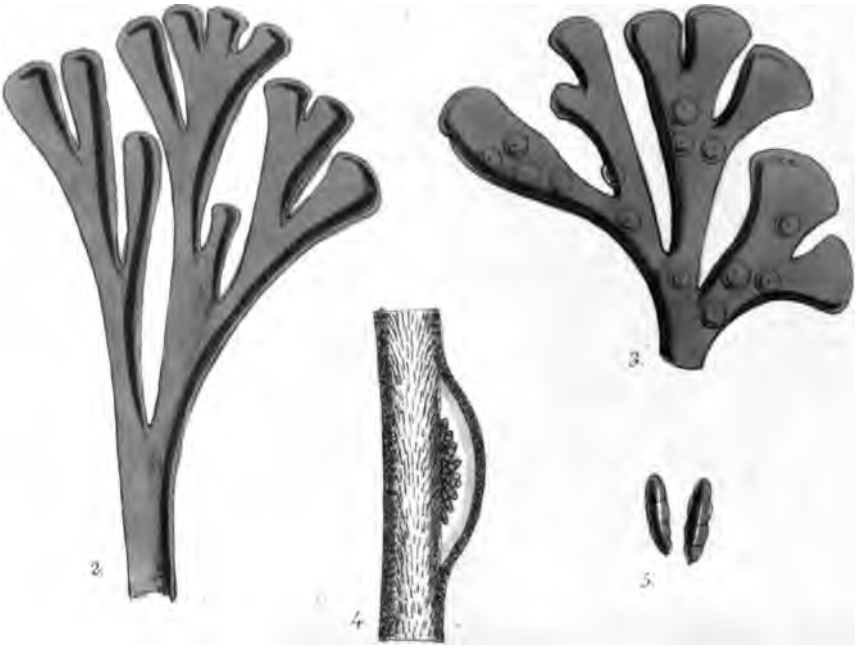
* Prof. Agardh has not explained this name, which he originally (1842) spelled *Nemostoma* (Alg. Medit. p. 89); changing it to *Nemastoma* in 1847.

when dry, is a dull and somewhat purplish red, not unlike that of the more coloury varieties of *Rhodymenia palmata*. The *substance*, though very soft, when fresh is membranaceous, and even papery when dry; and in drying the frond very imperfectly adheres to paper.

My acquaintance with this plant is confined to a single specimen given to me, with some other rare Tasmanian Algæ by Mr. W. Archer, of Cheshunt, Tasmania. It is not described in the 'Flora Tasmanica,' because, when preparing the descriptions of Algæ for that work, I had not decided where to place it; nor should I now figure it, but that I am unwilling to leave unrecorded so remarkable a plant, although, till its fruit be ascertained, the genus to which it belongs may be doubtful. In external habit, it nearly resembles the *Gloiosaccion? digitatum* of this work, but has a quite different cellular structure, and a deeper and duller colour. I hope the figure now given may direct the notice of collectors to this interesting species.

Fig. 1. NEMASTOMA PALMATA,—*the natural size*. 2. A *magnified* section of the frond.





Vincent Brooks, imp.

PLATE CCLXIII.

MASTOPHORA CANALICULATA, *Harv.*

GEN. CHAR. *Frond* stipitate, thinly incrusted with calcareous matter, flat, flexible, foliaceous upwards, flabelliform or dichotomously branched and fastigiate. *Fructification:* 1, *conceptacles* hemispherical, sessile, scattered over the whole frond, and containing in the base of the cavity a tuft of erect, oblong, at length four-parted spore threads.—MASTOPHORA (*Dcne.*), from μαστος, a *nipple*, and φορεω, to *bear*.

Frons stipitata, tenuiter calcarea, plano, flexilis, superne foliacea, flabelliformis v. dichotomo-fastigiata. Fruct.: 1, *ceramidia hemisphærica, sessilia, per totam frondem sparsa, apice poro pertusa, in fundo loculi fila sporifera fasciculata erecta demum zonatim quadripartita foventia.*

MASTOPHORA *canaliculata;* frond narrow-linear, dichotomo-multifid, fastigiate; laciniæ linear or subcuneate, with involute margins, channelled concolorous and glabrous on the lower side; ceramidia scattered.

M. canaliculata; *fronde anguste-lineari dichotomo-multifida fastigiata, laciniis linearibus v. subcanaliculatis margine involutis, subtus canaliculatis concoloribus glabris, ceramidiis sparsis.*

MASTOPHORA canaliculata, *Fl. Tasm. v.* 2. *p.* 310. *Harv. Alg. Austr. Exsic. No.* 443.

HAB. Port Fairy, *W. H. H.* Macdonnell Bay, *Rev. J. E. Wood.* Tasmania, *C. Stuart.*

GEOGR. DISTR. South coast of New Holland. Tasmania.

DESCR. *Root* an expanded incrustation on rocks and stones. *Frond* 3–4 inches high, and as much in expansion, somewhat flabelliform in outline, many times divided from just above the base, dichotomous or irregularly multipartite, the laciniæ scarcely more than a line or two in breadth. *Laciniæ* multifid, the lower ones exactly linear, the uppermost somewhat cuneiform, all with strongly reflexed or revolute edges, so as to form a channelled frond. Both surfaces are of the same colour and glabrous. The apices are slightly expanded, and obtusely truncate. *Ceramidia* nipple-shaped, scattered over the upper and middle segments, spore-threads linear oblong, zonately 4-parted. *Colour* a dull purplish red, becoming browner when dry, not in the least glaucous on either side. *Substance* calcareous, but flexible and somewhat tough, rigid when dry.

This species is readily known from the common *M. Lamourouxii* (Ner. Austr. t. 41), by its much narrower and nearly uniformly narrow fronds, channelled throughout their whole extent, and of the same colour on both surfaces; not conspicuously glaucous on the lower. It appears to be of rare occurrence, though received from two distant habitats.

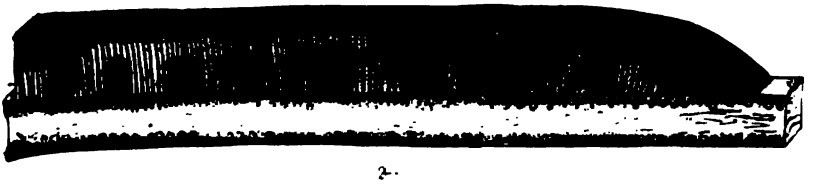
The genus *Mastophora*, founded by Decaisne, as a section of *Melobesia*, differs from *Melobesia*, more by the pliable and somewhat coriaceous substance of the frond, and by the more branching habit of the species included in it, than by any very definite characters. The *Melobesiæ* are evidently of a lower grade of organization than the *Mastophoræ*, which are, with one exception, natives of the Southern hemisphere; whereas *Melobesiæ* are found in all parts of the world, many of them having individually a cosmopolitan distribution.

Mastophora plana, Sond., found by Preiss in Western Australia, seems to be hardly distinguishable from some states of *M. Lamourouxii*.

Fig. 1. MASTOPHORA CANALICULATA,—*the natural size.* 2. Portion of the frond, lower surface. 3. Portion of the frond, upper surface, bearing conceptacles. 4. Section of the frond and a conceptacle. 5. Spore-threads:—the latter figures *magnified.*

Plate CCLXIV.

1.



2.

3

5.

4.

Vincent Bros. Lith.

PLATE CCLXIV.

RHODOPELTIS AUSTRALIS, *Harv.*

GEN. CHAR. *Frond* spreading horizontally, adnate, composed of articulated, vertical, closely-placed filaments, surrounded by hyaline, firm gelatine. *Fructification:* 1, ovoid, immersed *cystocarps,* wholly formed of dichotomous, whorled spore-threads, radiating from a vertical axis.—RHODOPELTIS (*Harv.*), from ῥοδεος, *red,* and πελτις, *a shield;* in allusion to the colour and form of the frond.

Frons horizontaliter expansa, adnata, filis verticalibus articulatis densissime stipatis, muco firmiore obvallatis, constituta. Fruct.: 1, *cystocarpia ovoidea, immersa, filis sporiferis dichotomo-multifidis, axi verticali verticillatim radiantibus formata.*

RHODOPELTIS *australis,* Harv. MSS.

CRUORIA? australis, *Harv. MSS. in Herb. T. C. D.*

HAB. Parasitical on *Amphiroa australis,* at Rottnest Island, West Australica, *W. H. H.*

GEOGR. DISTR. Western Australia.

DESCR. *Fronds* forming oval-oblong, shield-like patches, 3–4 lines in length and about 1–2 lines in breadth, on the surface of the joints of *Amphiroa australis,* one or more patch on each joint, separate, perfectly defined in outline. *Filaments* perfectly simple, erect, not half a line in length, closely placed, surrounded by hyaline gelatine, attenuated at base, wider upwards, articulated; the lower joints nearly cylindrical, scarcely contracted at the nodes, twice or thrice as long as broad, the upper more moniliform, and shorter in proportion to their diameter. *Cystocarps?* immersed in the substance of the frond, basal, oblong-ovoid in form, wholly composed of repeatedly-forked, fastigiate filaments (*spore-threads?*) which radiate to all sides from a central axis. No *spores* have been seen. *Tetraspores* unknown. *Colour* a dark blood-red, much deeper than the tint of the *Amphiroa.* *Substance* gelatinoso-coriaceous, very closely adhering to the substance on which it grows.

I have been puzzled where to place the curious little parasite here represented. In the structure of the skin-like frond there is a near agreement with *Cruoria,* so much so that at first I referred it to that genus. But as it happens that the *cystocarpic* fruit of *Cruoria* is unknown (as indeed is also that of all

the described genera of *Squamarieæ*, with the exception of *Peyssonnelia*), I fear to continue to associate it with plants which may have very different *cystocarps*. Nor am I quite certain whether to regard what I have above described for *cystocarps* as such in truth; or whether they may not rather be *antheridia*. They have indeed a good deal the structure of the cystocarps of *Scinaia*; but they still more nearly resemble the antheridia of *Callithamnion* and *Griffithsia*.

Unfortunately the *tetraspores* of our parasite are unknown. It is quite uncertain, therefore, whether it be most nearly related to *Actinococcus*, of which it has the habit, or to *Petrocelis* or *Cruoria*. Under these circumstances I am almost forced to place it, provisionally, in a separate genus.

Fig. 1. RHODOPELTIS AUSTRALIS, growing on a branch of *Amphiroa australis*, —*the natural size*. 2. Vertical section through the fronds of both plants. 3. Vertical filaments of the parasite. 4. One of its *cystocarps*. 5. Filaments from the same:—*magnified*.

PLATE CCLXV.

PORPHYRA WOOLHOUSIÆ, *Harv.*

GEN. CHAR. *Frond* membranous, flat and leaf-like, purple or rosy-red. *Fructification:* purple or rosy granules (spores) arranged in fours, dispersed over the whole frond.—PORHYRA (*Ag.*), from *πορφυρος, purple.*

Frons membranacea, plana, foliacea, purpurea v. rosea. Fruct.: sporæ purpureæ v. roseæ, quaternatæ, per totam frondem sparsæ.

PORPHYRA *Woolhousiæ;* frond delicately membranaceous, bright rosy-red, glossy, lanceolate or falcate, cuneate at base, simple or irregularly cleft.

P. Woolhousiæ; *fronde tenuiter membranacea amœnè rosea nitente lanceolata v. falcata, basi cuneata, simplici v. vage fissa.*

HAB. Parasitical on the leaves of *Macrocystis pyrifera,* Tasmania, *Miss Woolhouse.*

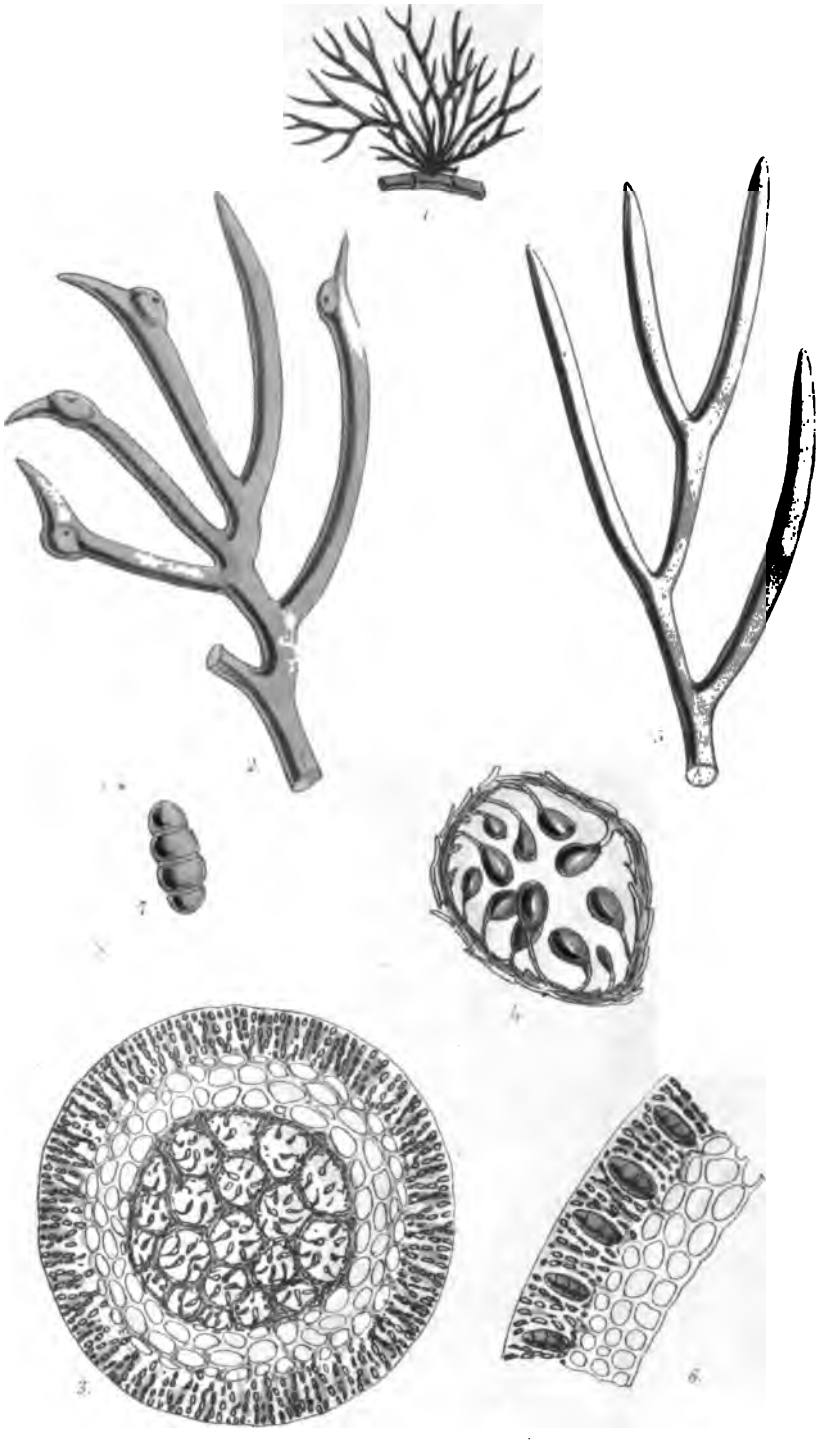
GEOGR. DISTR. ?

DESCR. *Root* a minute disc. *Frond* 6–8 inches or more in length, from 1–3 inches in breadth, cuneate at base, sometimes unequal-sided, and then strongly falcate, the concave margin being quite plain, the opposite margin wavy or plaited; sometimes equal-sided and then lanceolate, both margins equally wavy. The frond is either quite simple or cleft vertically into two or more linear-lanceolate laciniæ. The membrane is extremely thin and delicate, formed of a single row of cells; in an early stage of growth these are polygonal, equally distributed, and forming a tessellated or reticulated surface; afterwards each cell divides into two and then into four parts, which finally change into quaternate *spores.* When mature, any portion of the frond has the appearance represented at Fig. 4, where the quaternate spores stand apart, in the perfectly hyaline membrane. The *colour* is a brilliant rosy-red, resembling that of *Nitophyllum crispum:* and when dried the surface retains a strong gloss, as if glazed or varnished. The *substance* is extremely thin and soft, and in drying the frond most closely adheres to paper.

Of this beautiful and brilliantly-tinted species I have seen but two specimens, both from Tasmania, and both formerly in the

collection of Miss Woolhouse, of Sheffield, who has kindly persented to the Dublin Herbarium that from which our figure has been prepared. Miss Woolhouse is unable to say by whom the specimens were found, and I therefore dedicate the species to her, from whom I obtained all the materials for its history that I at present possess. In the pureness and intensity of its rose-colour this species differs from all other *Porphyræ* known to me, and indeed at first sight it might pass for some *Nitophyllum*, but for the peculiar glossy surface which is so characteristic of *Porphyræ*, and which exists only in a very minor degree in *Nitophyllum*. The frond adheres more closely to paper than other *Porphyræ*, and does not so greatly shrink in drying. Except in the extreme tenuity of the membrane, it offers no peculiarity of structure.

Fig. 1. PORPHYRA WOOLHOUSIÆ,—*the natural size.* 2. Part of the membrane in a young state. 3. The same in a more advanced stage; the endochrome beginning to change into spores. 4. The same, where quaternate spores are fully formed. 5. Endochromes of various stages, and perfect spores:—*magnified.*



Vincent Brooks, Imp.

PLATE CCLXVI.

ACANTHOCOCCUS PUSILLUS, *Harv.*

GEN. CHAR. *Frond* filiform or compressed, cartilaginous, vaguely much branched, composed of three *strata;* the *medullary* stratum of longitudinal, interwoven, and anastomosing filaments; the *intermediate* of large, roundish, empty cells, smaller outwards; the *cortical,* of minute, coloured, vertically seriated cellules. *Fructification:* 1, half-immersed *conceptacles,* containing, within a thick-walled pericarp, minute, pedicellate, oblong *spores,* attached to many slender, interlaced, parietal and internal placentæ; 2, *tetraspores* zonate, scattered.—ACANTHOCOCCUS (*Hook. fil. et Harv.*), from *ακανθος, a thorn,* and *κοκκος, fruit.*

Frons filiformis v. compressa, cartilaginea, vage ramosissima, striatis tribus contexta; strato medullari filis longitudinalibus intertextis anastomosantibus, intermedio cellulis magnis rotundatis vacuis extus sensim minoribus, corticali cellulis minutis coloratis verticaliter seriatis composito. Fruct.: 1, *cystocarpia semi-immersa, intra pericarpium crassum sporas minutas pedicellatas oblongas e placentulis plurimis tenuibus anastomostantibus parietalibus et internis egredientes foventia;* 2, *tetrasporæ zonatim divisæ sparsæ.*

ACANTHOCOCCUS pusillus; frond (about an inch long), irregularly forked or multifid, terete; branches subsimple, subulate, acute; conceptacles just below the straight or slightly falcate tips of the branches.

A. pusillus; *fronde unciali subdichotoma v. vage multifida tereti, ramis simpliciusculis subulatis acutis, cystocarpiis infra apices strictos v. vix falcatos ramorum semi-immersis.*

ACANTHOCOCCUS pusillus, *Harv. olim in Herb. T.C.D.*

DICRANEMA pusillum, *Harv. Alg. Austr. Exsic. n.* 313. *Harv. in Trans. R. I. Acad. v.* 22. *p.* 550.

HAB. On the stems of *Cymodocea antarctica.* South Australia, *Dr. Curdie.* Dredged near Emu Point, King George's Sound, *W. H. H.*

GEOGR. DISTR. South and south-west coasts of Australia.

DESCR. *Root* scutate. *Fronds* densely tufted, 1–1½ inch high, irregularly divided; sometimes but slightly branched, sometimes multipartite. *Branches* filiform or subulate, acute, nearly straight or curved, either quite simple, or once, twice, or several times divided; sometimes dichotomous, sometimes palmate. *Ramuli* erecto-patent, not attenuated at base. *Cystocarps* imbedded near the tips of the ramuli, the nucleus consisting of many honeycombed loculi, with fibro-cellular walls to which the solitary, pear-shaped

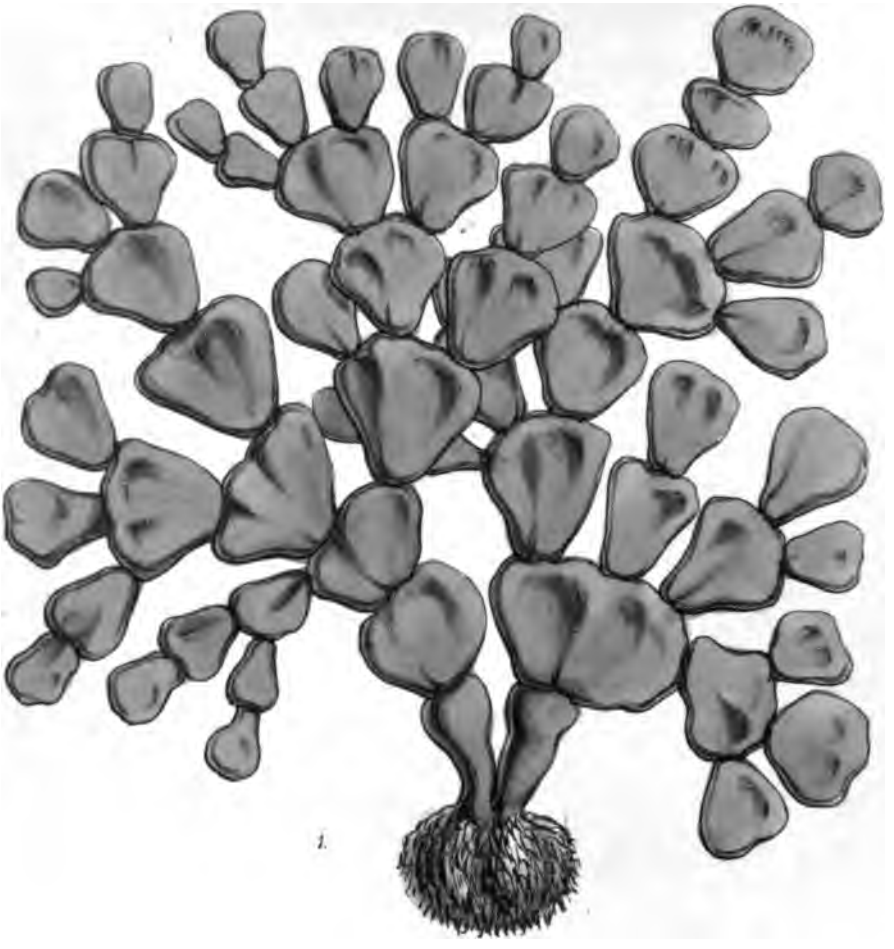
spores are attached. *Tetraspores* zonately divided, imbedded in the periphery of the ramuli. The *colour* is a dull red-brown, becoming darker in drying. The substance is rigid; and in drying, the frond very imperfectly adheres to paper.

A small species with which I first became acquainted by a single specimen given to me in 1851 by Dr. Curdie, of Geelong, and which I then correctly referred to the genus *Acanthococcus*, and placed in the University Herbarium, under the name here adopted. Strange to say, when I myself collected this plant, in 1854, at King George's Sound, I mistook its affinities, and without careful examination placed it in the genus *Dicranema*, of which it has externally the aspect. More recently, when preparing the analysis for our figure, I found that my first analysis was valid; the generic characters are clearly those of *Acanthococcus*, and the first-given name is now restored.

It is by much the smallest and least branching of the genus, never that I know of growing beyond the size represented in our Plate. Its favourite habitat is on the stems of *Cymodocea*, which it sometimes completely infests.

Fig. 1. ACANTHOCOCCUS PUSILLUS,—*the natural size*. 2. Portion of a frond, with conceptacles in the tips. 3. Section through a conceptacle. 4. Section of one of the loculi from the same, with *spores in situ*. 5. Portion of a frond, with tetraspores immersed in its periphery. 6. Portion of the periphery, showing the tetraspores *in situ*. 7. A *tetraspore*:—the latter figures variously *magnified*.

Plate [illegible]



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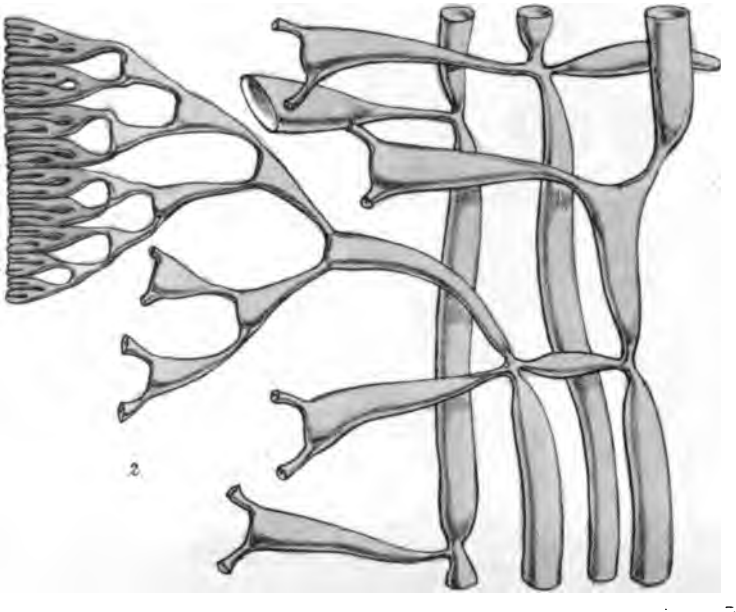

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PLATE CCLXVII.

HALIMEDA MACROLOBA, *Dne.*

GEN. CHAR. *Roots* fibrous, much branched. *Frond* dendroid, articulato-constricted, with flattened internodes (or *articulations*), coated with a calcareous crust, and composed internally of a plexus of longitudinal, subparallel, unicellular, branching filaments.—HALIMEDA (*Lamour.*), from one of the *Nereids.*

Radix fibrosa, ramosissima. Frons dendroidea, articulato-constricta, internodiis (articulisve) planiusculis, crustâ calcareâ corticata, intus e filis longitudinalibus subparallelis intertextis unicellularibus ramosis composita.

HALIMEDA *macroloba;* frond subsolitary, erect, shortly stipitate, distichously much branched; articulations thickened, all quite flat, and broader than their length, the lower ones broadly cuneate-obovate, the upper either cuneate or roundish reniform, entire or repand.

H. macroloba; *fronde subsolitaria erecta breve stipitata distiche ramosa, di-tri-poly-chotoma, articulis incrassatis omnibus complanatis oblatis, infimis late cuneatis obovatisve, superioribus nunc cuneatis nunc reniformi-rotundatis integris v. repandis.*

HALIMEDA macroloba, *Dne. Arch. du Mus. v.* 2. *p.* 118. *Kütz. Sp. Alg. p.* 504. *Harv. Alg. Austr. Exsic. n.* 562. *Harv. in Trans. R. I. Acad. v.* 22. *p.* 564.

HAB. On tidal rocks at Rottnest Island, and at Cape Riche, West Australia, rare, *W. H. H.*

GEOGR. DISTR. West and south-west coasts of Australia. Madagascar. Red Sea. Indian Ocean. Singapore, *Griffith!* Tidal coast reef, Keeling Islands, 3638, *Darwin!* Mindanao, Philippines, *Wilkes! Cuming!* Friendly Islands, *W. H. H.*

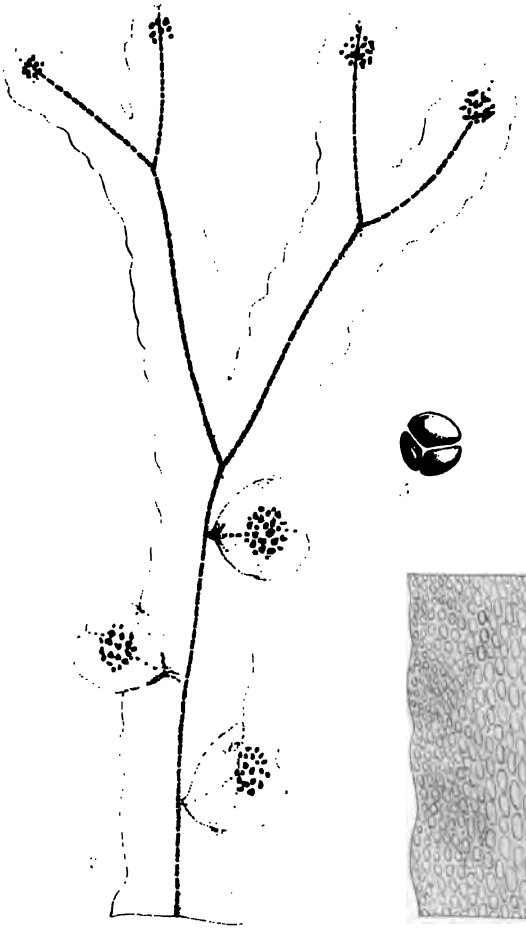
DESCR. *Root* a dense, spongy mass of interwoven, branching fibres. Lowest articulation stipitiform, much incrassated, oblong, somewhat wedge-shaped upwards, bearing on its expanded summit, one, two or several broadly cuneate articulations; these bear others, in several successive series, until a fan-shaped, distichous frond is the result. The form of the articulations varies in different parts of the frond, and in different specimens. In our Australian examples most of the articulations are broadly cuneate, some of the uppermost only verging to roundish or reniform. Specimens from Sincapore are not dissimilar, except that some of the medial articulations are either repand or somewhat 3–5-lobed or obscurely fingered. Those from the Keeling and Friendly Islands have more uniformly reniform lobes,

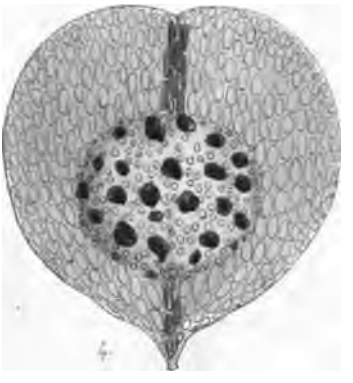
except in the lower part of the frond occasionally. In all cases the lobes are thick in substance, with a smooth, and sometimes a slightly glossy surface, and contain a considerable amount of carbonate of lime. The colour, when growing, is a pleasant yellowish-green; this fades, in the herbarium, to a pale-green or greenish-white. In drying, the frond does not adhere to paper.

At Plate CXXV. is figured a species of *Halimeda*, from the northern coast; and in now representing one more frequently met with, from the south-west coast, I add a magnified representation of some of the curious tubular tissue of which the body of the frond is made up. The closely placed and slightly cohering apices of the many-times-forked, lateral branches of the filaments that traverse the frond give definite outline to the articulations; and the lime with which they are, in this species, rather thickly coated, gives solidity and smoothness of surface.

H. macroloba is extensively distributed throughout the Indian and Pacific Oceans. In size and the shape of its articulations it approaches *H. Tuna*, but is of a much thicker substance, and secretes much more lime than that species. Both vary somewhat in the shape of the internodes.

Fig. 1. HALIMEDA MACROLOBA,—*the natural size.* 2. Some of the tubular branching tissue of which the frond is composed,—*magnified.*





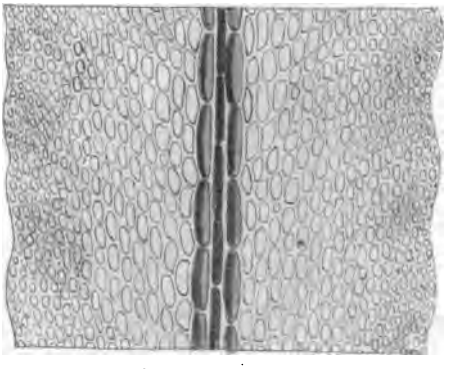


PLATE CCLXVIII.

DELESSERIA CRISPATULA, *Harv.*

GEN. CHAR. *Frond* leaf-like, membranous, areolated, symmetrical, simple or branched, midribbed. *Fructification:* 1, hemispherical *conceptacles,* sessile on the midrib or on a lateral nerve, containing a tuft of moniliform spore threads on a basal placenta; 2, tripartite *tetraspores,* in definite sori or spots, on the frond or on accessory leaflets.—DELESSERIA (*Ag.*), in honour of Baron Delessert, a distinguished patron of Botany.

Frons foliacea, membranacea, areolata, symmetrica, simplex v. ramosa, costata. Fruct.: 1, *coccidia in costa venisque frondis sessilia, hemisphærica, fila sporifera moniliformia a placenta basali emissa foventia;* 2, *tetrasporæ triangule divisæ, in soros definitos collectæ.*

DELESSERIA *crispatula;* frond (of small size) dichotomous, costate; segments linear, entire, undulate, obtuse; costa articulated, three-tubed, veins none; sori of tetraspores either in proper leaflets borne on the midrib, or in the apices of the forked segments.

D. crispatula; *fronde pusilla dichotoma costata, laciniis pluries furcatis linearibus integerrimis undulato-crispatis obtusis; costa articulata* 3-*siphonia, venis nullis, soris in sporophyllis propriis costa enatis v. infra apices laciniarum immersis.*

DELESSERIA crispatula, *Harv. in Trans. R. I. Acad. v.* 22. *p.* 548. *Harv. Alg. Austr. Exsic. n.*

HAB. On *Cymodocea antarctica.* At Fremantle, *W. H. H., G. Clifton.*

GEOGR. DISTR. Western Australia.

DESCR. *Root* a minute disc. *Fronds* single or tufted, 1–3 inches high, and as much in the expansion of the branches, repeatedly dichotomous, traversed by a very slender, articulated, 3-tubed midrib. *Laciniæ* linear, undulated, 1-1½ line broad, several times forked, either regularly or irregularly, the terminal divisions occasionally trifid, always very obtuse or subemarginate. In old specimens the midrib, toward the base of the fronds, becomes thickened and opaque. The *membrane* of the laminæ is very thin and delicate, composed of a single stratum of cellules, which are smaller towards the margin. The *cystocarps* are unknown. Sori of *tetraspores* either immersed in the apices of the segments, or borne in proper, roundish, or obcordate sporophylla, rising from the midrib. The *colour* is a pale rose-red, soon

given out in fresh water. The *substance* is membranous, but not gelatinous, and in drying the frond adheres pretty closely to paper.

I am indebted to my often-mentioned friend *G. Clifton* for the specimens here figured, which greatly exceed in size and beauty those which I myself collected in 1854. They serve to confirm the specific identity, but add nothing further to the history of the species, whose *cystocarps* still remain to be ascertained.

Among Australian species of *Delesseria* our *D. crispatula* has no very near ally. In its articulated midrib and delicacy of membrane it agrees with *D. hypoglossoides*, from which it differs very much in ramification. In this latter character it agrees with *D. denticulata*, but differs in size, in tenuity, in the perfectly entire margin, and in the articulated midrib; which last character will serve to distinguish it from all states of *D. alata*.

Fig. 1. DELESSERIA CRISPATULA,—*the natural size.* 2. Apex of a segment of the frond, bearing sporophylls and sori in the apices. 3. Small portion of the frond, to show the jointed midrib and cellular tissue. 4. A sporophyll. 5. *Tetraspore* from the same:—the latter figures *magnified.*

Vincent Brooks Imp.

PLATE CCLXIX.

PEYSSONNELIA MULTIFIDA, *Harv.*

GEN. CHAR. *Frond* flat, horizontally expanded, rooting by fibrils from the lower surface; composed of two strata of cells; the lower stratum of horizontal cylindrical cells, arranged in cohering, longitudinal filaments; the upper of similar cells, set in vertical cohering filaments. *Fructification* of both kinds lodged in superficial *warts* (*nemathecia*): *spores* roundish, in moniliform strings; *tetraspores* cruciate. —PEYSSONNELIA (*Dcne.*), in honour of *J. A. Peyssonnel*, an early and meritorious observer of marine plants, especially of Corallines.

Frons plana, horizontaliter expansa, inferiore pagina radicans, stratis duobus contexta; strato inferiore cellulis cylindraceis horizontalibus in fila longitudinalia cohærentia seriatis, superiore cellulis similibus in fila verticalia ordinatis constante. Fruct.: utriusque generis in nematheciis evoluti. Sporæ subrotundæ, moniliformiter seriatæ; tetrasporæ oblongæ, cruciatim divisæ.

PEYSSONNELIA *multifida;* frond coriaceous, opaque, dull red-brown, dichotomo-multifid, with reflexed margins; apices and axils obtuse; under surface concolorous, nearly glabrous.

P. multifida; *fronde coriacea opaca obscure fusco-rubra dichotomo-multifida, subtus concolori glabriuscula, marginibus reflexis, axillis apicibusque obtusis.*

PEYSSONNELIA multifida, *Harv. Alg. Austr. Exsic. No.* 329.

HAB. Tidal rocks, at Newcastle, N. S. Wales, rare, *W. H. H.*

GEOGR. DISTR. East coast of Australia.

DESCR. *Frond* attached at the base only by an expanded disc, ascending or suberect, very much branched in an irregularly dichotomous manner, 2–4 inches long, and fully as much in the expansion of the laciniæ. *Laciniæ* preserving a nearly uniform breadth of 3–4 lines throughout, linear, with recurved or revolute, somewhat thickened, margins, several times forked, all the divisions erecto-patent, with rounded sinuses and very obtuse apices. The under surface is nearly glabrous, being only furnished with a very few, minute, scattered hairs, which are not obvious without the microscope; it is concolorous with the rest of the frond (but frequently incrusted with zoophytes and corallines). The *structure* is dense, consisting of the usual under and upper stratum proper to the genus. No *fruit* has yet been observed. The *colour* is a very dark, red-brown, turning almost black in drying. The *substance* is rigid when dry, coriaceous and tough when recent. It does not adhere to paper.

In venturing to add another species to the genus *Peyssonelia*, I am not unmindful of the *P. Novæ-Hollandiæ*, Kütz., of which the character given by Kützing would answer very well for the plant now figured under a different name. My reasons for regarding our present plant as distinct are, that I am acquainted with a *Peyssonnelia* from the south coast which I take to be identical with Kützing's plant, and which differs from that now figured in colour, surface, and ramification; and that the plant now figured comes from a part of the east coast from which few collections have reached Europe. This is the most erect,—that is, the least *horizontal*, of the genus, the root-fibres of the lower surface having nearly disappeared. The cellular structure is identical with that of *P. squamosa*.

Fig. 1. PEYSSONNELIA AUSTRALIS,—*the natural size.* 2. Vertical section of the frond:—*magnified.*

Vincent Brooks, Imp.

PLATE CCLXX.

ALSIDIUM? COMOSUM, *Harv.*

GEN. CHAR. *Frond* filiform or compressed, cartilaginous, pinnately or irregularly decompound, opaque, coated with small, polygonal, irregular cellules; *axis* articulated, polysiphonous. *Ramuli* alternate, subulate, acute, transversely striate. *Fruit:* 1, *ceramidia*, containing, within a membranous pericarp, a tuft of pear-shaped spores: 2, tripartite *tetraspores*, lodged in lanceolate stichidia.—ALSIDIUM (*Ag.*), probably from ἁλς, *the sea*.

Frons filiformis v. compressa, cartilaginea, pinnatim v. vage decomposita, opaca, cellulis minutis polygonis irregularibus corticata; axi articulato, polysiphonio. Ramuli alterni, subulati, acuti, transversim striati. Fruct.: 1, *ceramidia, intra pericarpium tenue fasciculum sporarum pyriformium foventia;* 2, *tetrasporæ triangule divisæ, in stichidia lanceolata immersæ.*

ALSIDIUM? *comosum;* frond terete, robust, tree-like; stem percurrent, virgate, closely set throughout its greater length with virgate branches spreading in all directions; branches set with long, subulate-filiform ramuli, which are clothed with byssoid, subsimple, long-jointed ramelli.

A. ? comosum; *fronde tereti robusta dendroidea mollissima; caule percurrenti virgato ramis virgatiis quaquaversum egredientibus crebre onusto; ramulis filiformi-subulatis elongatis densis ubique ramellis byssoideis simpliciusculis longe articulatis velatis.*

HAB. At the Vasse, W. Australia, *Mrs. Brown.*

GEOGR. DISTR. West coast of Australia.

DESCR. *Root* and base of the *stem* unknown. *Stem* of unknown length, but probably at least 18 inches to 2 feet long, 1½–2 lines in diameter below, tapering upwards and attenuated to a fine point, quite simple, closely set, throughout the greater part of its length, with lateral branches spreading every way. *Branches* 4–5 inches long, virgate, as thick as a sparrow's quill at base, tapering to a very slender point, quite simple, but set, like the stem, with closely-placed, erecto-patent, filiform, simple ramuli. *Ramuli* setaceous, about an inch long, clothed with byssoid ramelli. *Ramelli* 2–3 lines long, extremely soft and delicate, either quite simple or once forked near the base, articulated; their articulations cylindrical, many times longer than broad. *Fruit* at present unknown. A cross section of one of the inarticulate branches shows a single row of coloured, peripheric cells, surrounding a cellular body, in which the articulated axis is not very obvious. *Colour* a

full rosy-crimson, discharged in fresh water, and becoming brown-red in drying. *Substance* extremely soft and subgelatinous. In drying the frond adheres most closely to paper.

Until the fruit of this very remarkable plant shall be ascertained, its generic relations cannot be definitely fixed. I place it provisionally in *Alsidium*, as well on account of its general habit, as from the laxity of the cellular tissue of the stem; but it may perhaps be more properly a species of *Rhodomela;* being (like *R. comosa*, which is otherwise very different) clothed in all the younger parts with byssoid ramelli, like those of a *Dasya*, to which genus also it seems to bear much affinity.

The only specimen I have yet seen I owe to Mr. Clifton, by whose sister (Mrs. Brown) it was collected at the Vasse, a locality as yet but very imperfectly explored, but which promises to furnish many interesting Algæ.

Fig. 1. ALSIDIUM? COMOSUM,—*the natural size.* 2. Cross section of a branch. 3. Small portion of a ramulus, bearing articulated ramenta:—the latter figures *magnified.*

PLATE CCLXXI.

DASYA SCOPULIFERA, *Harv.*

GEN. CHAR. *Frond* filiform or compressed, dendroid; stem and branches coated with small, polygonal cells (rarely articulated, and many-tubed); the axis articulate, composed of several radiating cells surrounding a central cavity; ramelli articulated, one-tubed. *Fructification:* 1, ovate or urceolate *ceramidia;* 2, lanceolate *stichidia,* attached to the ramelli, and containing triangularly-parted tetraspores in transverse rows.—DASYA (*Ag.*), from δασυς, *hairy.*

Frons filiformis v. compressa, dendroidea. Caulis ramique majores strato cellularum corticati (raro pellucide articulati), ramellis monosiphoniis obsessi; axis articulatus, ex cellulis pluribus radiantibus tubum centralem cingentibus formatus. Fruct.: 1, *ceramidia ovata v. urceolata;* 2, *stichidia lanceolata, ex ramellis enata, tetrasporas transversim ordinatas foventia.*

DASYA (Stichocarpus) *scopulifera;* frond dendroid, robust, rigid, thickly corticated throughout, 5-tubed; stem simple, filiform, set with several long, simple, cord-like lateral branches, which are irregularly but densely beset with short, brush-like ramuli; ramuli clothed with incurved, simple, subulate, acute, basally attenuated, jointed ramelli; joints of the ramelli 2–3 times as long as broad; ceramidia ovate, terminating short ramuli.

D. (Stichocarpus) scopulifera; *fronde dendroidea robusta rigida crassissime corticata 5-siphonia, caule simplici filiformi, ramis lateralibus numerosis simplicissimis longissimis ramulis scopiformibus onustis, ramulis ramellis articulatis incurvis simplicibus subulatis basi attenuatis velatis, articulis ramellorum diametro 2–3-plo longioribus, ceramidiis ovatis ramulos breviores coronantibus.*

DASYA (Stichocarpus) scopulifera, *Harv. in Herb. T. C. D.*

HAB. At Bunbury, W. Australia, rare, *G. Clifton.*

GEOGR. DISTR. West coast of Australia.

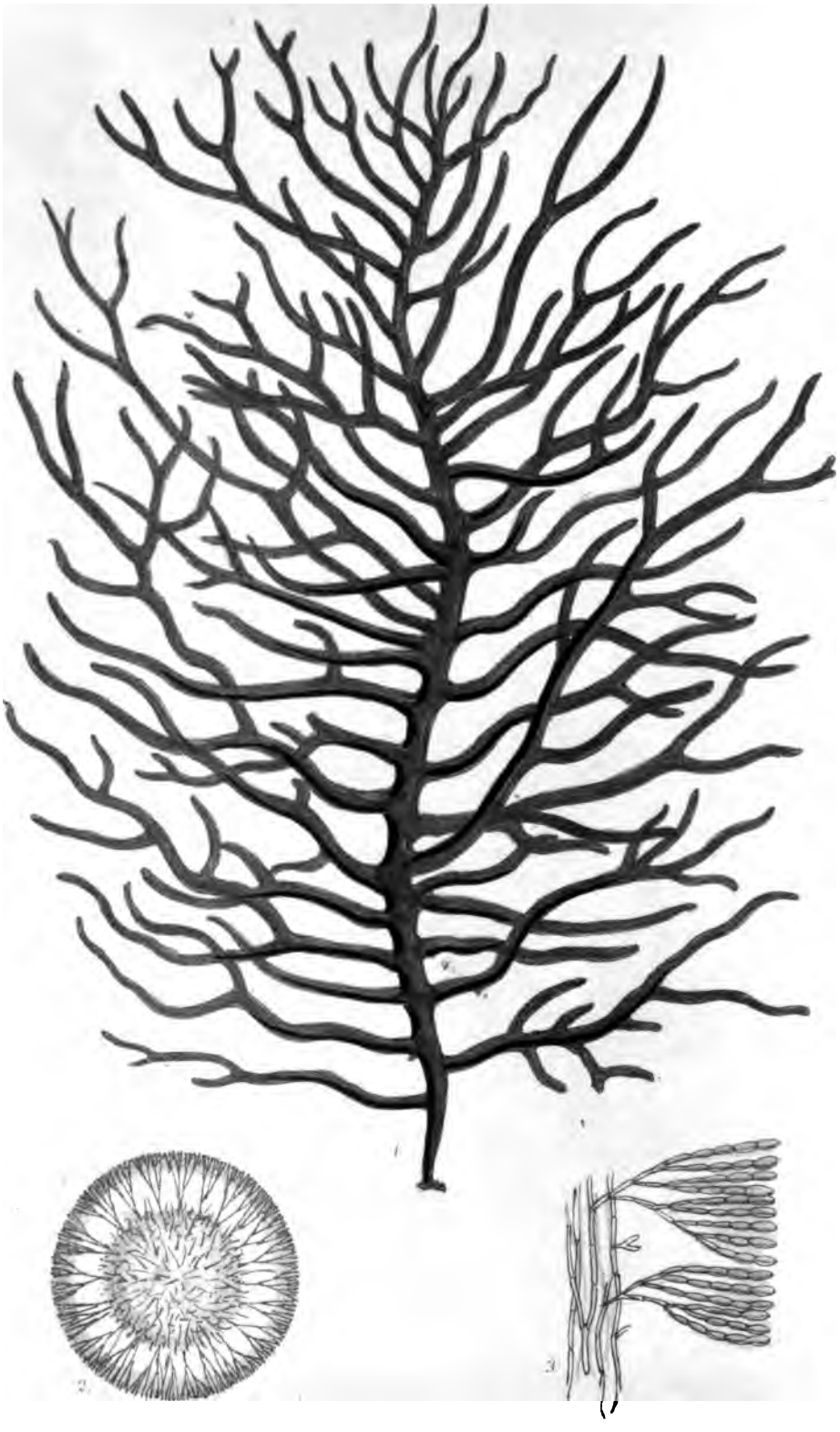
DESCR. *Root* discoid. *Frond* 10–12 inches long or more, 1–2 lines in diameter at base, tapering upwards to the thickness of a sparrow's quill. Stem quite simple, cord-like, attenuated upwards, irregularly beset with several similar lateral branches. These *branches* are 6–8 inches long, emitting from all sides, from their bases to within a short distance of the apex, irregularly placed, solitary or tufted, short branchlets; the apices of the branches bare of branchlets and resembling tails. The *branchlets* or *ramuli* are $\frac{1}{4}$–$\frac{1}{2}$ inch long, setaceous, and so closely clothed, from a short distance above the base, with ramelli, as to resemble little brushes. All the ramuli, as well as the

branches and stem, are perfectly opaque and thickly corticated; the external coating of the branches being greatly thicker than the articulated 5-tubed axis. *Ramelli* alone are visibly articulated; the terminal articulation is acute; the rest about twice as long as broad; and the basal ones are narrowed towards the base. *Ceramidia* exactly ovate, without projecting orifice, containing a tuft of pear-shaped spores. *Stichidia* unknown. The *colour* is a dark-red, becoming almost black in drying. The *substance* is hard, close, and compact, coriaceous when dry, in which state the frond does not adhere to paper.

This is a coarse-growing plant, remarkably different in that respect from most species of *Dasya*, to which genus, notwithstanding that its *stichidia* are unknown, I have no hesitation in referring it. It belongs to the section *Stichocarpus*, and appears to be most related to *D. hormoclados*, from which it differs widely in habit, in substance and colour, and in the form and position of its conceptacles.

It appears to be a deep-water species, and rarely thrown up. The capsule-bearing specimens are shorter and more branched, the lateral branches being again divided, than that represented in our plate.

Fig. 1. DASYA SCOPULIFERA,—*the natural size.* 2. A ramulus, with a fertile branch, crowned with a *ceramidium.* 3. Tuft of spores, from the same. 4. Ramelli. 5. Cross section of the stem:—*all magnified.*



Vincent Brooke Imp

PLATE CCLXXII.

HELMINTHOCLADIA AUSTRALIS, *Harv.*

GEN. CHAR. *Frond* cylindrical, gelatinous, branched to all sides, formed of a fibrous axis and continuous periphery of investing filaments; *axis* composed of branching, longitudinal filaments loosely interwoven; peripheric filaments issuing subhorizontally from the threads of the axis, dichotomous, fastigiate, free. *Cystocarps* immersed in the peripheric stratum, formed of many spore-threads radiating from a central point. *Tetraspores* unknown.—HELMINTHOCLADIA (*J. Ag.*) from ἕλμινς, a *worm*, and κλαδος, a *branch*; the soft, gelatinous branches resemble worms.

"*Frons teretiuscula, gelatinosa, quoquoversum ramosa, axi filisque investientibus, stratum continuum periphericum formantibus, constituta; axis filis ramosis laxe intertextis longitudinalibus articulatis contextus; fila peripherica a filis axis subhorizontaliter egredientia, dichotoma, fastigiata, invicem libera. Desmiocarpia strato peripherico subimmersa, filis gemmidiiferis plurimis clavatis a puncto centrali radiantibus nudis constituta.*" *J. Ag.*

HELMINTHOCLADIA *australis;* frond terete, wormlike, decompoundly much branched, branches lateral, horizontally patent, attenuated upwards, spreading to all sides, simple or compound.

H. australis; *fronde tereti vermiformi decomposite ramosissima, ramis lateralibus horizontaliter patentibus sursum attenuatis quoquoversum egredientibus simplicibus v. ramosis.*

HELMINTHOCLADIA australis, *Harv. in Herb. T. C. D.*

HAB. Fremantle, W. Australia.

GEOGR. DISTR. West coast of Australia.

DESCR. *Root* a small disc. *Fronds* densely tufted, 6–12 inches long, and fully as much in the expansion of the branches. Main *stem* generally undivided, percurrent, closely set throughout its whole length with horizontally patent branches, of which the lowest are longest and most compound. *Branches* worm-like, not attenuated at base, but tapering to a subacute apex, either quite simple or once or twice forked, and frequently furnished with lateral, simple, or forked secondary branches. *Fruit* unknown. *Colour* a pale, dull, brownish purple, soon fading in fresh water. *Substance* cartilagineo-gelatinous, tough and elastic, very soft. In drying, the frond most closely adheres to paper.

That this plant belongs to Agardh's genus *Helminthocladia*, founded on the *H. purpurea* of the coasts of Europe, there can be little doubt. My only doubt respecting it is, lest it should not be sufficiently distinct specifically from *H. purpurea* itself, which is a very variable plant, and to some of whose varieties our plant bears considerable resemblance. In general, there is more difference in diameter between the main stem and its branches in the European than in the Australian plant; the Australian is also more densely branched, grows in more crowded tufts, and is of a paler and duller colour. Still, I cannot point to any very definite characters by which it may be distinguished.

Fig. 1. HELMINTHOCLADIA AUSTRALIS,—*the natural size.* 2. Cross section of a branch. 3. Partial longitudinal section, showing the arrangement of the axile threads, and those of the periphery :—the latter figures *magnified.*

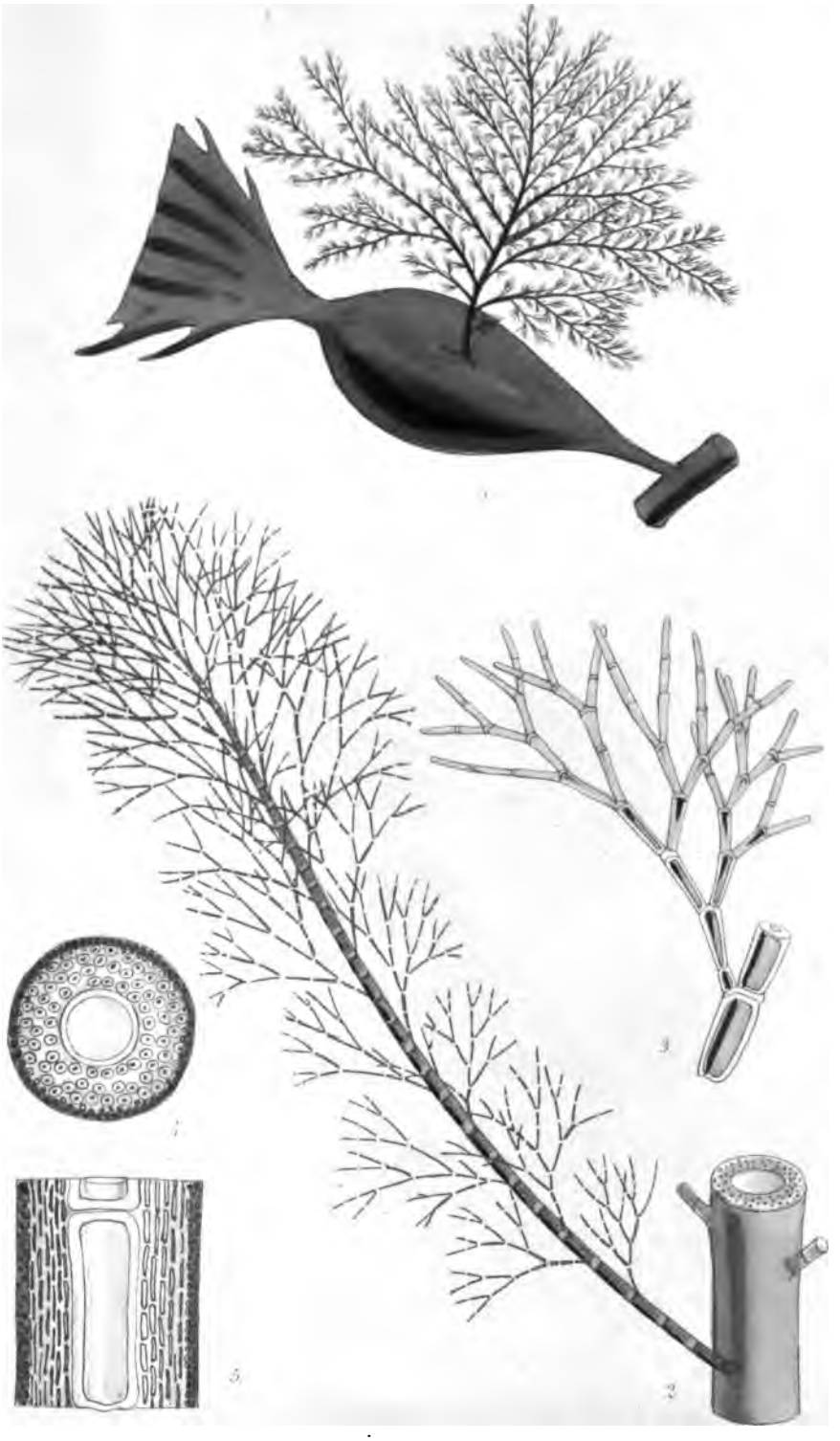

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PLATE CCLXXIII.

CALLITHAMNION? PENICILLATUM, *Harv.*

GEN. CHAR. *Frond* filiform, branched, articulated, monosiphonous, the stem and branches (in many species) at length thickened internally or coated externally with decurrent filaments; ramuli always pellucidly articulate and monosiphonous. *Fructification:* 1, *favellæ* generally in pairs, axillary or sessile on the branches, naked, containing numerous angular spores; 2, *tetraspores* naked, sessile or pedicellate, distributed on the ramuli, generally triangularly parted.—CALLITHAMNION (*Lyngb.*), from καλλις, *beautiful,* and θαμνιον, *a little shrub.*

Frons filiformis, ramosa, articulata, monosiphonia, caule ramisque majoribus (in pluribus) demum fibris decurrentibus interne vel externe evolutis corticatis v. firmatis; ramulis semper pellucide articulatis. Fruct.: 1, *favellæ binatæ, axillares v. ad ramos sessiles, nudæ, sporas numerosas angulatas foventes;* 2, *tetrasporæ nudæ, ad ramulos sessiles v. pedicellatæ, triangule v. crucialim divisæ.*

CALLITHAMNION *penicillatum;* tree-like; stem and branches thickly corticated throughout, decompoundly branched, ultra-setaceous; branches nearly naked, or thinly beset with minute, byssoid, pencil-like, articulated ramuli; ramuli clothed with very slender, many times forked ramelli; articulations of the ramelli 4-5 times as long as broad; fruit unknown.

C. penicillatum; *dendroideum, caule ramulisque crassissime corticatis decomposite ramosis ultra-setaceis, ramis nudiusculis vel ramulis pusillis byssoideis penicillatis articulatis laxe obsessis, ramulis alterne ramelliferis, ramellis tenuissimis multoties dichotomis, ramellorum articulis diametro* 4–5-*plo longioribus; fructu utriusque generis ignoto.*

CALLITHAMNION penicillatum, *Harv. Alg. Austr. Exsic. n.* 516.

HAB. On the vesicles of *Macrocystis pyrifera,* at Port Philip Heads, rare, *W. H. H.*

GEOGR. DISTR. South coast of Australia.

DESCR. *Root* a minute disc. *Frond* 2–3 inches high, and as much in the expansion of the branches, thicker than bristle at base, gradually tapering upwards, irregularly branched, inarticulate, opaque, thickly coated with cortical cellules. *Branches* virgate, subsimple, alternate or secund, rarely subopposite, acute, the older ones naked or nearly so, the younger emitting minute pencil-like ramuli. *Ramuli* scarcely a line long, very slender, articulated, clothed with excessively minute, soft and slender many

times forked ramelli. *Articulations* of the ramuli thrice, of the ramelli 4–5 times as long as broad. *Fruit* unknown. *Colour* of the stem and branches dark red; of the ramuli rosy. *Substance* of the stem and branches cartilaginous, rather rigid; of the ramuli very soft and flaccid. In drying the plant adheres pretty freely to paper.

A rare species, and only found, so far as I know, on the vesicles of *Macrocystis*. It is at present doubtful whether this plant belongs to *Callithamnion* or to *Wrangelia;* or whether it may not prove to be a species of *Thamnocarpus*, if that genus is to be kept up. There is a greater solidity and opacity of stem and branches than is common in *Callithamnion*, and the articulated ramuli are wholly out of proportion, in development, to the rest of the frond, though scarcely quite so much so as in *Thamnocarpus*. These ramuli, when the plant is steeped long in fresh water, turn to a dull green, but do not decay, while the rest of the frond retains its red colour: another circumstance anomalous in *Callithamnion*.

I trust that some of the active algologists of Victoria may discover the fruit, of both kinds, and thus enable us to fix the genus of this interesting Alga.

Fig. 1. CALLITHAMNION PENICILLATUM, growing on a vesicle of *Macrocystis*, —*the natural size*. 2. Frustule of a branch, bearing one of the byssoid pencilled ramuli. 3. A ramellus from the same. 4. Transverse section of a branch. 5. Longitudinal section of the same:—the latter figures variously *magnified*.

Vincent Brooks Imp.

PLATE CCLXXIV.

SPYRIDIA PROLIFERA, *Harv.*

GEN. CHAR. *Frond* filiform, pinnately decompound, articulated, but gradually becoming coated with a layer of small, coloured cellules; branches and ramuli furnished with minute, bristle-shaped, articulated ramelli. *Cystocarps* terminating short branches, involucrated or naked, containing within a closed, membranous pericarp, numerous *nucleoli* of oblong spores. *Tetraspores* formed along the ramelli, external, sessile, triangularly parted.—SPYRIDIA (*Harv.*), from σπυρις, *a basket.*

Frons filiformis, pinnatim decomposita, articulata, sensim cellulis minutis coloratis corticata; ramis ramulisque ramellis articulatis setiformibus minutis plus minus instructis. Cystocarpia ramos breves terminantia, ramellis involucrata, v. nuda, intra pericarpium clausum membranaceum nucleolos plures sporarum oblongarum foventia. Tetrasporæ ad genicula ramellorum evolutæ, externæ, sessiles, triangule divisæ.

SPYRIDIA *prolifera;* frond robust, tall, rigid, terete, inarticulate, very thickly corticated, sparingly and irregularly branched; branches simple or forked, more or less beset with short, capillary, tufted, branched or simple, ramelliferous ramuli; ramelli setaceous, alternate, acute; tetraspores secund on the ramelli.

S. prolifera; *fronde robusta elata rigida tereti inarticulata crassissime corticata parce et vage ramosa, ramis simplicibus furcatisve ramulis brevibus capillaribus fasciculatis ramosis v. simpliciusculis ramelliferis plus minus obsessis, ramellis setaceis alternis acutis, tetrasporis ad ramellos secundis.*

SPYRIDIA prolifera, *Harv. MS. in Herb. T. C. D.*

HAB. At Fremantle, Aug. 1854, rare, *G. Clifton.*

GEOGR. DISTR. West coast of Australia.

DESCR. *Root* and base of the frond unknown. *Frond* at least 8–10 inches long, probably much more, half a line to nearly a line in diameter, opaque, very thickly corticated with minute cellules, sparingly and irregularly branched. *Branches* virgate, 2–4 inches long, simple or forked, alternate or secund, spreading every way, either naked or irregularly beset with short branchlets. *Branchlets* springing horizontally from the stem and branches, in tufts or single, 3–5 lines in length, capillary, imperfectly articulate or subinarticulate, branched or subsimple, densely clothed with minute ramelli. *Ramelli* a line long, alternate, patent, subulate, acute, simple at the apex, articu-

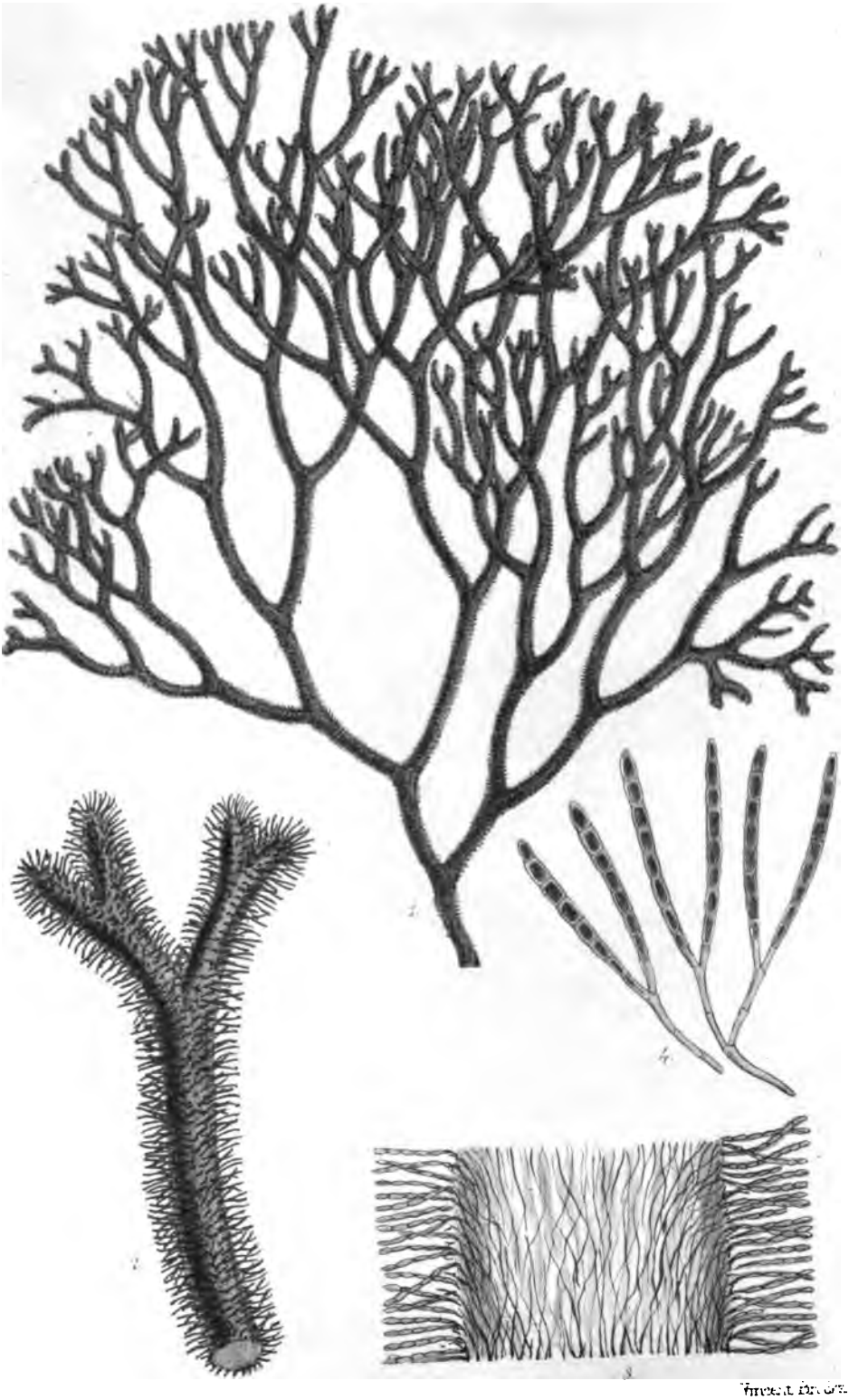
lated, slightly contracted at the dissepiments. *Articulations* as long as broad. *Cystocarps* unknown. *Tetraspores* sessile on the inner surface of the ramelli. *Colour* of the stem and branches dark red; of the ramuli blood-red. *Substance* cartilaginous and rather rigid. In drying, the stem and branches adhere imperfectly, the ramuli more closely, to paper.

A singular-looking Alga, remarkable for the great disproportion between the diameter of the stem and branches and that of the ramuli. These latter seem to sprout out proliferously, at no certain point, without apparent order. It is possible that in the young plant there may be a greater gradation, and that the specimens here figured are plants of the second year, which had become denuded, and have pushed forth a new crop of young branches. Against this view it may be urged that no intermediate state has yet been observed in the eight years that have elapsed since Mr. Clifton first collected this plant. Though the *cystocarps* are unknown, it can scarcely be doubted that our plant is a *Spyridia*.

I regret that the plate has been struck in too *purple* an ink.

Fig. 1. SPYRIDIA PROLIFERA,—*the natural size*. 2. Portion of one the proliferous ramuli. 3. Ramelli, from the same, one of them bearing *tetraspores*. 4. A transverse section of a branch,—*magnified*.

Plate CCLXXV



Vincent Brooks

PLATE CCLXXV.

GALAXAURA CLIFTONI, *Harv.*

GEN. CHAR. *Frond* dichotomous, thinly incrusted with carbonate of lime, constricted as if jointed, or continuous, composed of longitudinal, colourless, interwoven, and anastomosing *medullary* filaments, and closely placed, inflated or tabular, coloured *peripheric* cellules. *Fruit* unknown.—GALAXAURA (*Lamx.*), a classical name; one of the Oceanidæ of Hesiod.

Frons dichotoma, calcareo-incrustata, articulato-constricta v. continua, plus minus transversim rugulosa, ex filis medullaribus tenuibus hyalinis longitudinalibus intertextis anastomosantibus, et cellulis periphericis subuniseriatis coloratis inflatis liberis v. complanatis, arcte cohærentibus, formata. Fructus ignotus.

GALAXAURA (Microthoe) *Cliftoni;* frond cartilagineo-carnose, scarcely calcareous, terete, dark brownish-purple, many times forked, fastigiate, tomentose; superficial filaments once or twice forked, coloured, cylindrical, articulated, the joints once and a half as long as broad.

G. (*Microthoe*) Cliftoni; *fronde cartilagineo-carnosa vix calcarea tereti fusco-purpurea decomposite dichotoma fastigiata tomentosa, tomenti filis furcatis coloratis cylindraceis articulatis, articulis diametro sesquilongioribus.*

GALAXAURA (Microthoe) Cliftoni, *Harv. in Herb. T. C. D.*

HAB. At Fremantle, West Australia, *G. Clifton.* Attached to *Codium tomentosum,* at Warnamboul, *H. Watts, n.* 100.

GEOGR. DISTR. West and south coasts of Australia.

DESCR. *Root* and base of the stem not known to me. *Fronds* (probably several from the same base) 6–8 inches long, and as much in the expansion of the branches, a line or rather more in diameter, terete, many times forked, fastigiate, with rounded axils and blunt apices. Every portion of the frond is densely coated with horizontal, hairlike, jointed filaments, issuing from the longitudinal threads of which the frond is chiefly formed. The aspect to the naked eye is as if the branches were covered with a velvety pile of threads. These are once or twice forked, cylindrical, articulated, the articulations coloured, and about once and half as long as broad. *Fructification* unknown. *Colour,* a dark brownish-purple or dingy red. The *substance* is far less calcareous than in most other species of *Galaxaura,* and is firmly cartilaginous and elastic, shrinking somewhat in drying. The plant adheres firmly to paper in drying.

The frond, in this species, secretes much less calcareous matter than in most others of the genus, being nearly as soft as in *Liagora*, to which genus it might be referred with nearly as much propriety as to *Galaxaura;* indeed it may be regarded as a connecting link between these genera. I refer it in preference to *Galaxaura*, because of its obvious affinity with *G. marginata*, which in the young state produces terete tomentose fronds. In our present plant such continues to be the mode of growth to maturity, without any disposition to form the flattened, smooth branches which mark the mature stage of *G. marginata.*

Fig. 1. Frond of GALAXAURA CLIFTONI,—the *natural size.* 2. Portion of an upper branch. 3. Longitudinal section of the frond. 4. Forked peripheric filaments :—*magnified.*

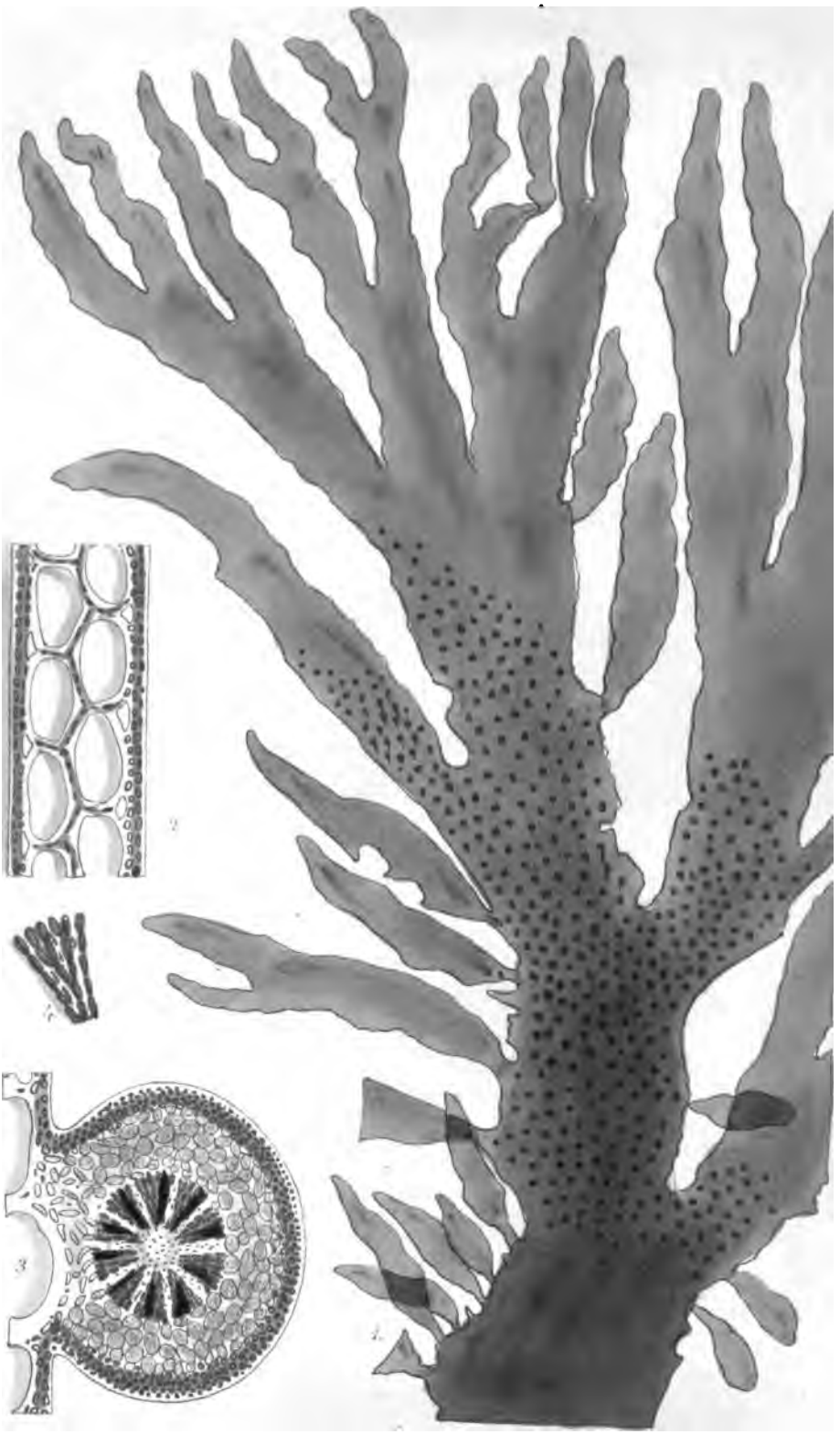

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PLATE CCLXXVI.

RHODOPHYLLIS BARKERIÆ, *Harv.*

GEN. CHAR. *Frond* flat, membranous, dichotomously or pinnately decompound, mostly margined with leafy or slender processes, and composed of two strata of cells; the medullary stratum formed of roundish-angular cells, the cortical of coloured cellules in one or few rows. *Fructification:* 1, marginal, external conceptacles, containing within a pericarp formed of radiating filaments, a compound nucleus, formed of bundles of spore-threads radiating from a basal (or central) placenta; 2, zonate *tetraspores,* immersed in the peripheric cells of the segments or marginal processes.—RHODOPHYLLIS (*Kütz.*), from ῥοδεος, *red,* and φυλλον, *a leaf.*

Frons plana, membranacea, dichotome v. pinnatim decomposita, segmentisque ciliisve marginalibus obsita, stratis duobus contexta; strato medullari cellulis rotundato-angulatis, corticali cellulis coloratis uni- v. pauci-seriatis composito. Fruct.: 1, *cystocarpia marginalia, externa, pericarpio filis moniliformibus radiantibus conflato munita, nucleum compositum ex fasciculis filorum radiantium formatum foventia; filis demum in sporas solutis;* 2, *tetrasporæ zonatim divisæ, fronde v. lacinulis marginalibus immersæ.*

RHODOPHYLLIS *Barkeriæ;* frond cuneate at base, expanded upwards, multifid; laciniæ broad, oblong or cuneate, the smaller ones lanceolate, subacute, with rounded axils; cystocarps very numerous, thickly scattered over the surface of the larger laciniæ.

R. Barkeriæ; *fronde basi cuneata sursum expansa multifida, laciniis latis oblongis v. cuneatis, minoribus lanceolatis subacutis, axillis rotundatis, cystocarpiis numerosissimis per lacinias majores densissime sparsis.*

RHODOPHYLLIS Barkeriæ; *Harv. in Herb. T. C. D.*

CALLOPHYLLIS? expansa, *Harv. Alg. Austr. Exsic. n.* 390.

HAB. Philip Island, Western Port, *W. H. H.,* Cape Shank, *Mrs. Barker.*

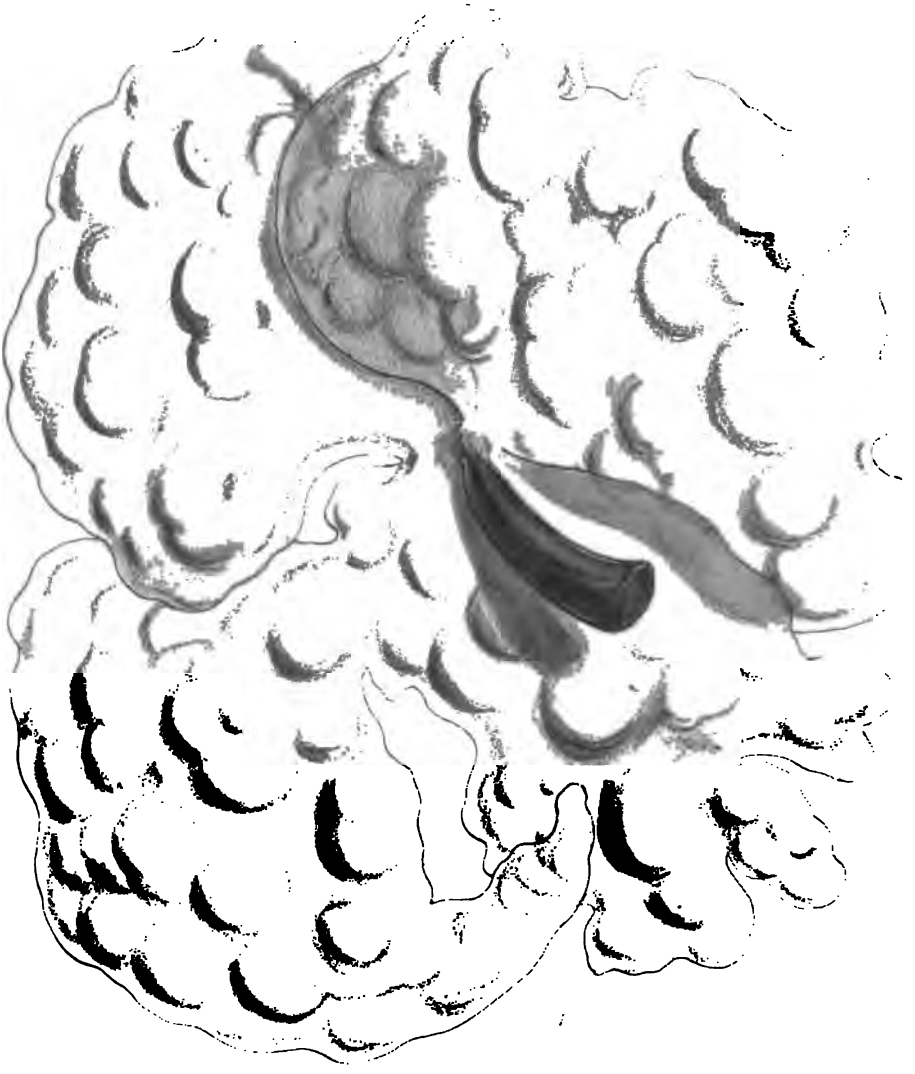
GEOGR. DISTR. South coast of Australia.

DESCR. *Root* a small disc. *Frond* rising with a cuneate base from a minute stem, rapidly expanding into a membrane 10–15 inches long, and as much or more in the expansion of the laciniæ. The frond is deeply divided, nearly to the base, into two or more principal laciniæ, which are from one to two inches wide; these are variously cleft, sometimes in a subdichotomous, more

frequently in a subpinnatifid manner; some of the minor ones being secundly multifid, others pinnate. The *axils* throughout are rounded, and the *apices* more or less acute. The *margin* is smooth and flat, or slightly undulate, sometimes bearing proliferous, lanceolate leaflets. *Cystocarps* very numerous and prominent, globose, thickly scattered over the surface, principally in the middle region of the frond, sometimes covering the lateral segments. *Tetraspores* unknown. *Colour*, a vivid rosy or blood-red, or a deep lake. *Substance*, rather thickish membranous, soft, succulent, closely adhering to paper in drying.

In 1855 I collected a few specimens of this plant, without fruit, and, guided by external habit, referred them provisionally to *Callophyllis;* but a fine specimen in fruit recently received from Mrs. BARKER proves the plant to be properly referable to *Rhodophyllis.* I take advantage of this change of generic name to alter the specific name also; and in now dedicating the species to Mrs. BARKER, I wish to present my best thanks to that lady for several parcels of well selected and admirably preserved specimens of Algæ, collected at Cape Shank, a locality as yet unvisited by any other collector. I am also indebted to Dr. Müller for his kindness in transmitting Mrs. Barker's parcels.

Fig. 1. Segment of a frond of RHODOPHYLLIS BARKERIÆ,—*the natural size.* 2. Section of the membrane of the frond. 3. Section through a cystocarp. 4. Strings of spores from the same:—*magnified.*



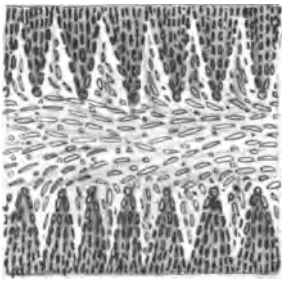


PLATE CCLXXVII.

SCHIZYMENIA? BULLOSA, *Harv.*

GEN. CHAR. *Frond* flat, thickish, entire or torn, formed of two strata; the *medullary* of sparingly branched, densely interwoven, jointed threads; the *cortical* of moniliform threads, vertical to the surface, and set in firm gelatine. *Fructification:* 1, favellæ, immersed in the substance of the frond, simple, containing within a gelatinous envelope a mass of roundish spores; 2, cruciate tetraspores, dispersed through the outer stratum of the frond.—SCHIZYMENIA (*J. Ag.*), from σχιζω, *to cut,* and ὑμην, *a membrane.*

Frons carnoso-plana, integra aut lacerata, duplici strato cellularum constituta; medullari filis articulatis parce ramosis densissime intertextis constante; corticali filis moniliformibus verticalibus muco cohibitis contexto. Favellæ infra stratum exterius utrinque nidulantes, simplices, intra periderma gelatinosum hyalinum sporas rotundatas, demum per canalem strato exterioris liberatas, foventes. Tetrasporæ strato exteriori demersæ, sparsæ, cruciatim divisæ. J. Ag. Sp. Alg. 2, *p.* 169.

SCHIZYMENIA *bullosa;* stipitate; stipes very thick and fleshy, cylindrical; frond umbilicate-cordate, horizontal, irregular in outline, carnoso-membranaceous, crumpled all over.

S. bullosa; *stipitata; stipite crassissimo carnoso-corneo cylindraceo; fronde basi umbilicato-cordata horizontali subrotundata v. varie fissa aut omnino irregulari carnoso-membranacea bullata.*

SCHIZYMENIA ? bullosa, *Harv. in Herb. T. C. D.*

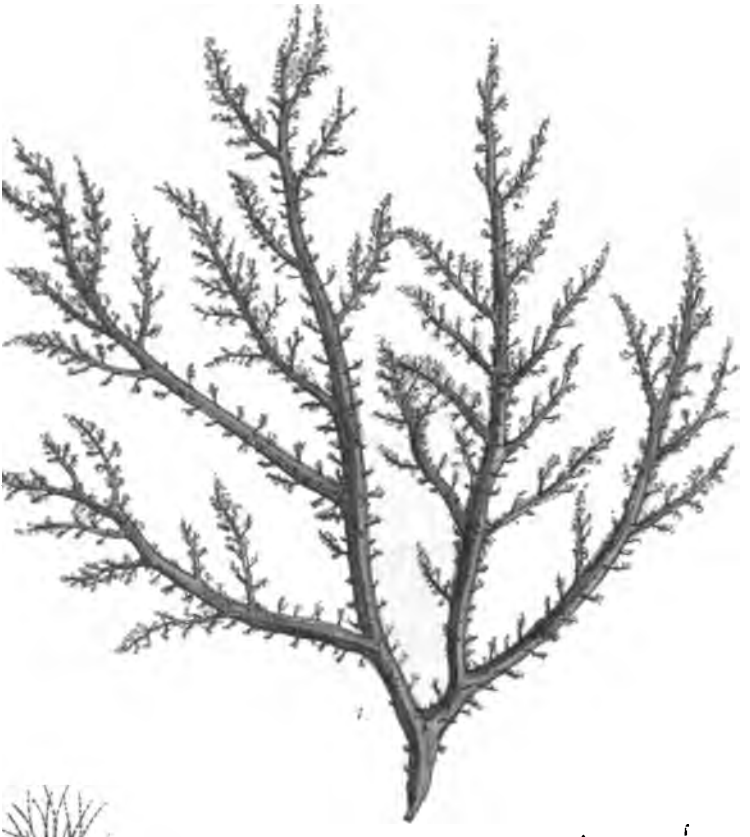
HAB. Fremantle, *W. H. H., G. Clifton.*

GEOGR. DISTR. West coast of Australia.

DESCR. *Root* unknown. *Stipes* 1–1½ inches long, 4–5 lines in diameter at base, 2–3 lines at the summit, terete, rigid and horny, emitting from its summit a horizontally spreading frond. *Frond* imperfectly umbilicate or somewhat peltate-cordate at base, the basal lobes overlapping each other, roundish reniform in general outline, 6–12 or more inches in diameter, the margin undulate or repand, variously torn and at length very irregular. The surface of the lamina is generally very much puckered or bullated with convexities and opposite concavities, only in the young state tolerably flat. No fruit has been observed. The *colour* is a pale red, or somewhat sanguineous, fading to yellow. The *substance* is soft, thickish-membranous, lubricous and elastic. In drying, the frond shrinks unequally, and closely adheres to paper.

If this be not a very lovely, at least it is a very remarkable Alga, combining as it does something of the habit of *Constantinea* with the structure and substance of *Schizymenia*, in which latter genus, until its fruit be ascertained, it may be placed provisionally. The enormously thick stipes is so very strange and anomalous, that on first inspection of the dried specimens I supposed it to be some extraneous body to which the membrane had attached itself. A careful examination shows that this is not the case. Probably the stipes may be perennial, like that of a *Laminaria*, producing an annual frond from the summit. The frond seems to expand horizontally, like the peltate leaf of a Water-lily, and it would merely require the cohesion of the large basal lobes to render it completely peltate. Though I collected fragments cast ashore at Fremantle, in 1854, Mr. Clifton has the merit of having first discovered the stipes. I presume his specimens were collected on the beach, as the base of the stem seems wanting. A fragment from Mr. Clifton of what, from its bullated surface and substance, appears to belong to this species, induces me to suppose that the lamina, when full grown, attains much larger dimensions than above given. It may perhaps be two or three feet across!

Fig. 1. SCHIZYMENIA BULLOSA,—*the natural size.* 2. Section, showing the structure of the frond,—*magnified.*



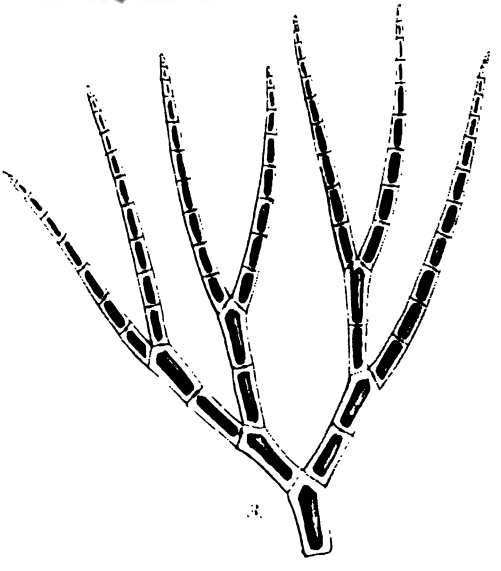


PLATE CCLXXVIII.

DASYA SARCOCAULON, *Harv.*

GEN. CHAR. *Frond* filiform or compressed, dendroid; stem and branches coated with small, polygonal cells (rarely articulated, and many-tubed); the axis articulate, composed of several radiating cells surrounding a central cavity; ramelli articulated, one-tubed. *Fructification:* 1, ovate or urceolate *ceramidia;* 2, lanceolate *stichidia,* attached to the ramelli, and containing triangularly-parted tetraspores in transverse rows.—DASYA (*Ag.*), from δασυς, *hairy.*

Frons filiformis v. compressa, dendroidea. Caulis ramique majores strato cellularum corticati (raro pellucide articulati), ramellis monosiphoniis obsessi; axis articulatus, ex cellulis pluribus radiantibus tubum centralem cingentibus formatus. Fruct.: 1, *ceramidia ovata v. urceolata;* 2, *stichidia lanceolata, ex ramellis enata, tetrasporas transversim ordinatas foventia.*

DASYA *sarcocaulon;* frond rosy, dendroid, forked or subsimple, very thick and succulent, alternately decompound; stem and branches thickly corticated with minute cellules, glabrous, beset with short brush-like ramuli; ramuli subulate or filiform, spreading to all sides, clothed with short, very slender, taper-pointed, dichotomous ramelli; articulations of the ramelli about thrice as long as broad.

D. sarcocaulon; *fronde rosea dendroidea simpliciuscula v. furcata crassissima succulenta alterne decomposita; caule ramisque cellulis minimis omnino corticatis glabris ramulis ornatis; ramulis brevibus scopæformibus subulatis quoquoversum egredientibus ramellis obsessis; ramellis tenuissimis dichotomis apice attenuatis; articulis ramellorum diametro triplo longioribus.*

DASYA sarcocaulon, *Harv. in Herb. T. C. D.*

HAB. Fremantle, Aug., 1858. *G. Clifton.* (No. 8.)

GEOGR. DISTR. Western Australia.

DESCR. *Root* unknown. *Frond* at least 4–5 inches long (but probably much more), 1–2 lines in diameter, opaque and thickly coated with small cells throughout, tapering to the ends of the branches, irregularly divided, but (comparatively) not much branched. *Stem* and branches quite glabrous, bare of ramelli; the branches spreading to all sides, sometimes bearing a second series of similar branches, which, as well as the primary, are sprinkled with short ramuli. These *ramuli* are patent, either awl-shaped or thread-shaped, opaque, and beset on all sides with very slender, minute, dichotomous ramelli. *Ramelli* scarcely a line, often not half a line in length, articulated; their articulations thrice as long as broad. *Fructification* un-

known. *Colour* a rosy red. *Substance* soft, succulent. In drying the whole plant closely adheres to paper.

This species belongs to the same group as *D. naccarioides* and *D. elongata*, but differs by the remarkably thick and succulent stem and branches, and something in the general aspect and substance. Until its fruit be known, however, some doubt may rest upon its specific distinctness. The substance is so soft, and has so combined with the paper on which the specimens are preserved, that I have not been able to give a cross cutting of the stem.

The specimens appear as if broken off from a much larger frond, none of them having a base. Possibly they may be merely upper branches. In this case, judging by the diameter of the broken stump, the main frond may be some feet in length. I hope this figure may induce Mr. Clifton to look after this plant again.

Fig. 1. DASYA SARCOCAULON,—*the natural size.* 2. Apex of a ramulus, with its ramelli. 3. Ramellus,—*magnified.*

PLATE CCLXXIX.

CLIFTONÆA LAMOUROUXII, *Harv.*

GEN. CHAR. *Frond* stipitate, formed of secundly proliferous, halved, pectinate phyllodia. *Phyllodia* costate, with diverse sides; one side flat, areolate, membranous, very entire; the other pectinatopartite. *Fructification* unknown.—CLIFTONIA (*Harv.**), in honour of George Clifton, Esq., R.N., the indefatigable and successful explorer of the Algæ of Western Australia.

Frons stipitata, ex phyllodiis secunde proliferis hemiphyllis hinc pectinatis evoluta. Phyllodia costata, lateribus diversis; uno latere plano areolato membranaceo integerrimo, altero pectinatopartito. Fructus ignotus.

CLIFTONÆA *Lamourouxii;* phyllodia scimitar-shaped, semipinnate, their laciniæ cultrate, flat, toothed on the lower margin, shorter than the breadth of the lamina.

C. Lamourouxii; *phyllodiis acinaciformibus semipinnatis, laciniis cultratis planis hinc denticulatis laminæ latiusculæ latitudine subbrevioribus.*

CLIFTONIA Lamourouxii, *Harv. Phyc. Austr. sub. t. C.*

AMANSIA semipennata, *Lamour. Ess. p.* 55. *t.* 5. *f.* 4, 5; *Ag. Sp. Alg.* 1. *p.* 195; *Kütz. Phyc. Gen. p.* 447; *Syst. p.*

HAB. W. Coast of Australia, *Peron.*

GEOGR. DISTR. ?

DESCR. *Root* unknown to me. *Stem* 1–2 inches long, nearly a line in diameter, coriaceous, rigid when dry, arched, naked, or more or less fringed on the concave side with the remains of pinnules. *Phyllodia* numerous, springing from the convex side of the stem, 2–4 inches long, nearly ½ inch wide, scimitar-shaped, the older ones with a valid costa, the younger with a very slender one. The outer or *convex* side of the phyllodium is winged with a semilanceolate, transversely striate, delicately membranous lamina, 2 or 3 lines in width, composed of oblong, hexagonal cellules, set in horizontal rows, all of equal length, and about twice or thrice as long as their diameter. The internal or *concave* side is closely pinnulated with a double row of cultrate laciniæ, which are rather shorter than the width of the opposite lamina. These *laciniæ* are flat and leaflike, and composed, like the opposing lamina, of hexagonal, oblong cellules, regularly disposed in transverse lines; they are nearly straight, and quite entire on the upper margin, curved and denticulate on the lower; the form is almost exactly that of a coulter. The

* Originally published as *Cliftonia;* now altered to *Cliftonæa,* in order to distinguish it from *Cliftonia,* Banks, which supersedes by four years' earlier date the *Mylocaryum* of Willdenow.—*W. H. H.*

colour, in our specimen, has completely faded; it is probably a crimson-lake or purple. The *substance* is membranous, and rather rigid, and in drying the frond imperfectly adheres to paper. No fructification observed.

This, which is perhaps the very rarest of all Australian Algæ, is also, next to *Claudea*, the most remarkable in form and evolution. I am therefore unwilling to close the 'PHYCOLOGIA AUSTRALICA,' without giving as satisfactory a figure of it as I am able, although my materials for so doing are very incomplete. Not having myself collected it, and not having received it from any of my many friends in Australia, I have used, in making the analysis, a small specimen formerly given by Lamouroux to Dawson Turner, and now in the Hookerian Herbarium. The larger upper figure has been made partly from this specimen and partly adapted from Lamouroux's plate. Though it may not be quite true to nature, it will, I trust, be found tolerably characteristic, and is the best I can supply.

The exact part of the coast where Peron collected this rarity is unknown; probably it was on the western or north-western seaboard. Mr. Clifton may yet have the honour of re-discovering the present species, as he has exclusively that of discovering its ally, *C. pectinata* (Pl. C.). The *fruit* of both species is still a desideratum.

Fig. 1. CLIFTONÆA LAMOUROUXII,—*the natural size.* 2. Portion of a phyllodium; one of the laciniæ,—*magnified.*

Plate

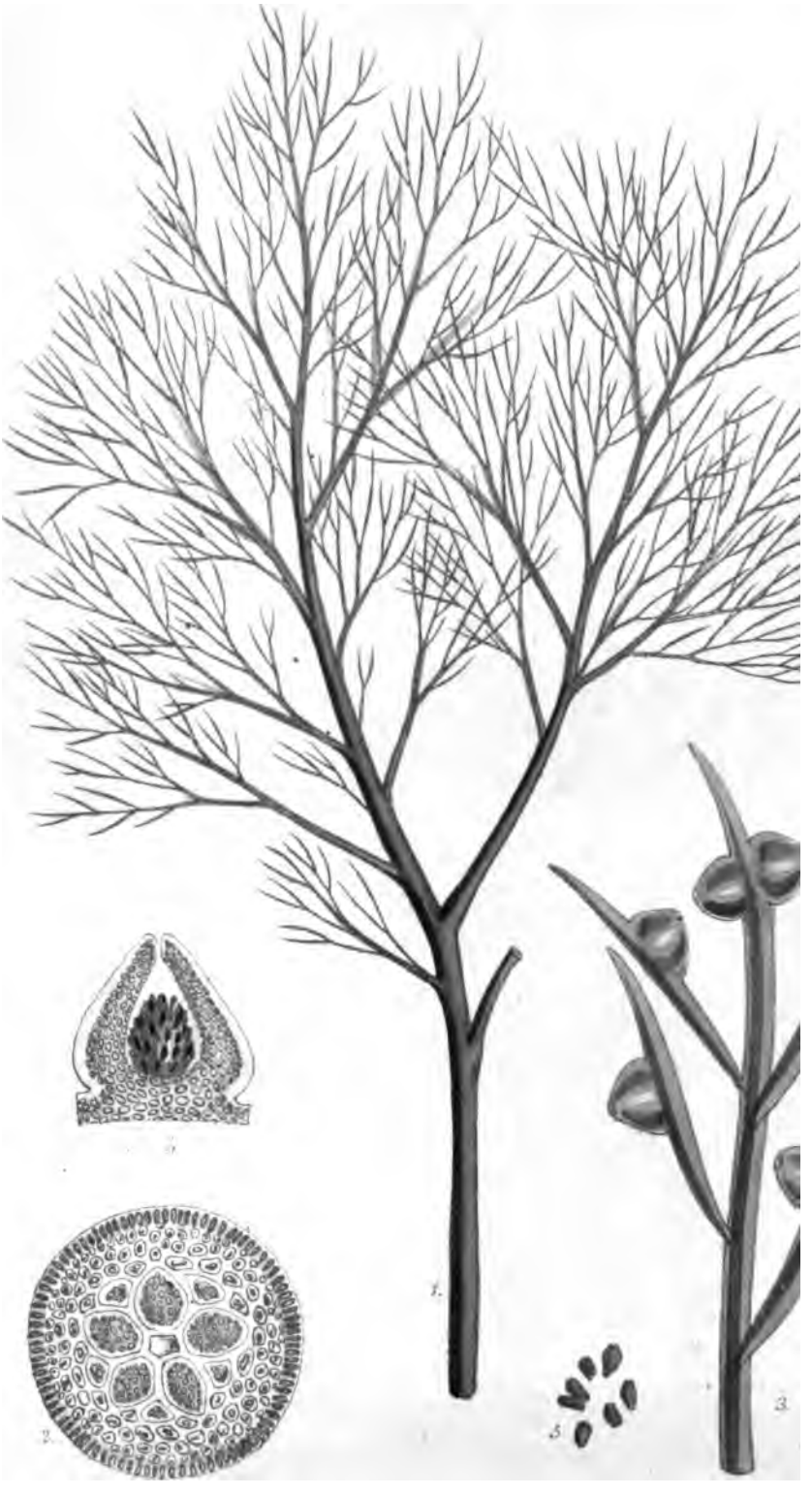


PLATE CCLXXX.

CHONDRIA RUBRA, *Harv.*

GEN. CHAR. *Frond* filiform, cartilagineous, dendroid, opaque, coated with small, polygonal, irregularly-placed cells. *Axis* articulated, polysiphonous. *Ramuli* clavæform, much constricted at their insertion. *Fructification:* 1, ovate *ceramidia;* 2, tripartite *tetraspores,* formed irregularly, in the clavate ramuli.—CHONDRIA (*Ag.*), χονδρος, *cartilage.*

Frons filiformis, cartilaginea, dendroidea, opaca, cellulis irregularibus polygonis corticata. Axis articulatus, polysiphonus. Ramuli clavati, basi constricti. Fruct.: 1, *ceramidia ovata;* 2, *tetrasporæ triangule divisæ, in ramulis immersæ, sparsæ v. irregulariter aggregatæ.*

CHONDRIA *rubra;* dendroid, robust, rigid, blood-red; frond irregularly decompound, much branched, the branches scattered, spreading to all sides, gradually attenuated; ramuli linear-fusiform, acute, narrowed to the base; ceramidia ovate, sessile on the sides of the ramuli.

Ch. rubra; *dendroidea, robusta, rigida, sanguinea; fronde vage decomposita ramosissima; ramis sparsis quoquoversum egredientibus sensim attenuatis; ramulis lineari-fusiformibus acutis basi angustatis; ceramidiis ovatis ad latera ramulorum sessilibus.*

CHONDRIA rubra, *Harv. in Herb. T. C. D.*

HAB. W. Australia, *G. Clifton.*

GEOGR. DISTR. ——?

DESCR. *Root* unknown. *Stem* 6–8 inches long (or probably much longer), 1½ lines in diameter at base, tapering much to the summit, either simple or once or twice forked, the main divisions closely set with alternate or scattered branches. *Branches* spreading every way, repeatedly divided in an irregular manner, each set more slender than the preceding, the lesser ones mostly alternately divided. *Ramuli* scattered, erect, filiform, but slightly narrowed at base, acute, 3–5 lines long. The stem and larger branches are perfectly opaque, the smaller branches and ramuli, under a lens, are marked with transverse striæ (as in *Rytiphlœa*), at distances about equal to the diameter of the part. These disappear under the microscope; they are caused by the cells of the articulated 5-tubed axis, seen through the cortical layer. *Ceramidia* ovate, sessile on the ramuli, with thick walls and a narrow, hyaline limbus; spores small. *Tetraspores* unknown. *Colour* a bright blood-red, turning darker (and blackish in the stems) in drying. *Substance* rather rigid. In drying it adheres very imperfectly to paper.

The cellular *structure* of the frond in this species, and especially that of the lesser branches and ramuli, is very similar to the structure of the same parts in *Rytiphlœa*, so much so that at one time I supposed this plant to be nearly allied to *R. elata*, and to differ chiefly in colour and greater opacity of surface. But the structure of the ceramidium and the fusiform ramuli, both point to *Chondria* as the true affinity. In *Chondria* it will not need to be compared with any known species, the substance and general aspect are so different. The blood-red colour, considerably preserved in drying, is similar to that of *C. clavata*, a species otherwise very unlike it.

Fig. 1. CHONDRIA RUBRA,—*the natural size.* 2. Cross section of a branch. 3. Some ramuli, bearing *ceramidia.* 4. Section through a ceramidium. 5. Spores,—*magnified.*

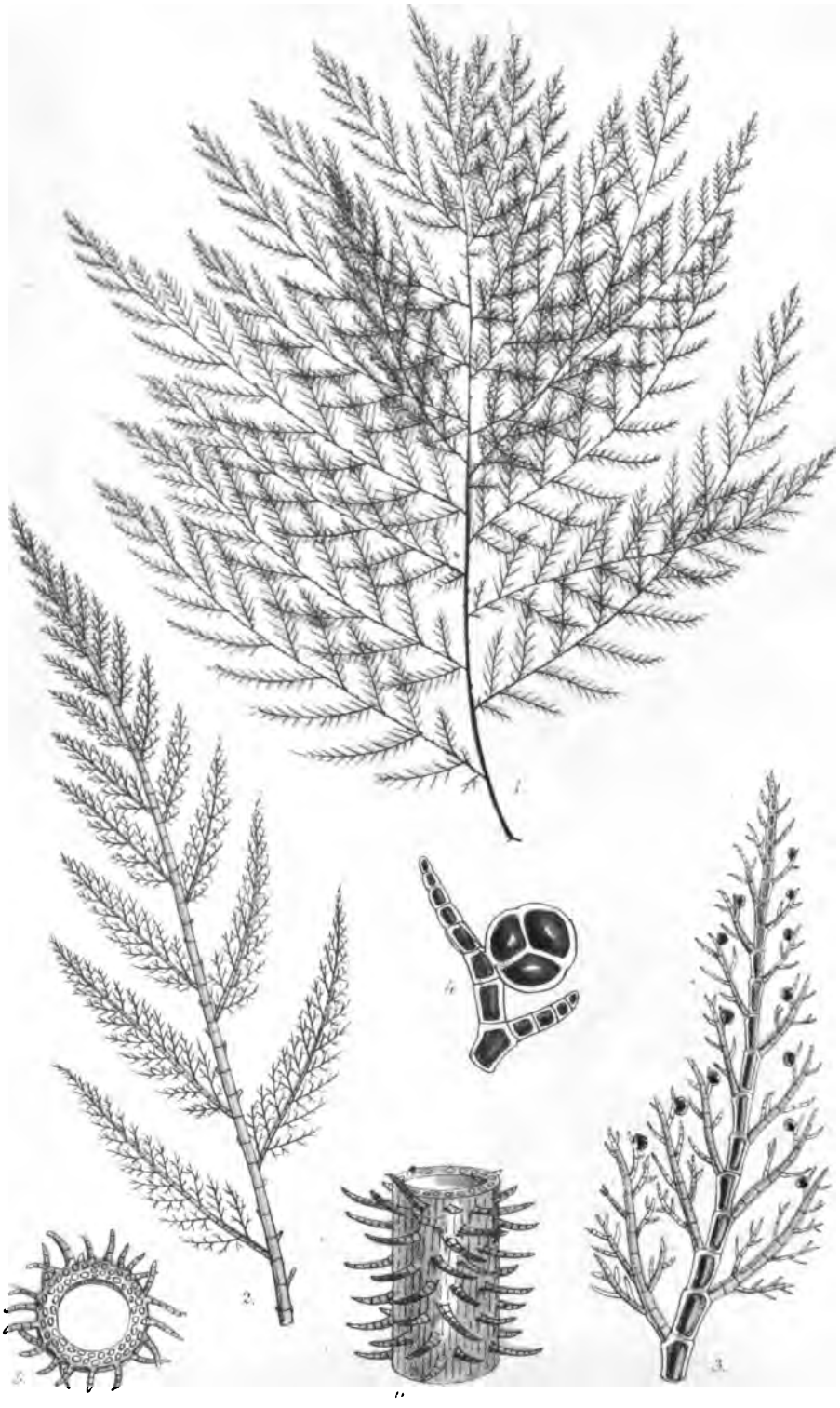


PLATE CCLXXXI.

CALLITHAMNION FORMOSUM, *Harv.*

GEN. CHAR. *Frond* filiform, branched, articulated, monosiphonous, the stem and branches (in many species) at length thickened internally, or coated externally with decurrent filaments; ramuli always pellucidly articulate and monosiphonous. *Fructification:* 1, *favellæ* generally in pairs, axillary or sessile on the branches, naked, containing numerous angular spores; 2, *tetraspores* naked, sessile or pedicellate, distributed on the ramuli, generally triangularly parted.—CALLITHAMNION (*Lyngb.*), from καλλις, *beautiful*, and θαμνιον, *a little shrub.*

Frons filiformis, ramosa, articulata, monosiphonia, caule ramisque majoribus (in pluribus) demum fibris decurrentibus interne vel externe evolutis corticatis v. firmatis; ramulis semper pellucide articulatis. Fruct.: 1, *favellæ binatæ, axillares v. ad ramos sessiles, nudæ, sporas numerosas angulatas foventes;* 2, *tetrasporæ nudæ, ad ramulos sessiles v. pedicellatæ, triangule v. cruciatim divisæ.*

CALLITHAMNION *formosum;* frond slender, elongate, distichous, decompound-pinnate, all the divisions alternate; stem and primary branches opaque, corticated and minutely hispid; penultimate branches (*plumules*) about tripinnate, lanceolate; pinnæ erecto-patent, their articulations about twice as long as broad; tetraspores solitary, below the tips of the ultimate pinnules.

C. formosum; *fronde setacea elongata disticha decomposite pinnata alterne divisa; caule ramisque primariis opacis corticatis hispidulis, plumulis subtripinnatis, pinnis erecto-patentibus, earum articulis diametro 2–3-plo longioribus; tetrasporis infra apicem pinnularum solitariis, sessilibus.*

CALLITHAMNION formosum, *Harv. Alg. Austr. Exsic. n.* 515.

HAB. Port Philip Heads, *W. H. H.*

GEOGR. DISTR. South coast of Australia.

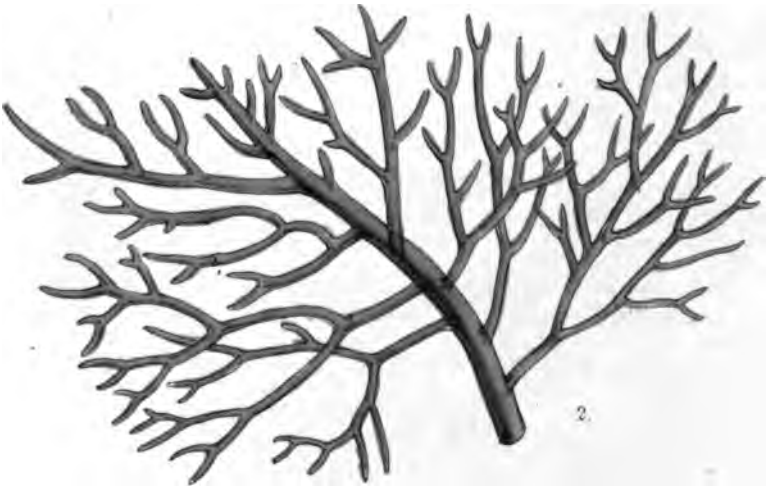
DESCR. *Root* a small disc. *Frond* 6–8 inches long, and as much in the extension of the branches, distichous, alternately decompound, many times pinnate, feathery. *Stem* setaceous below, capillary above, alternately branched; both stem and branches opaque, coated with two or three rows of small cellules, and covered with short, patent, jointed hairs. *Branches* lanceolate in outline, alternately plumulate. *Plumules* also lanceolate, pellucidly articulate, about thrice pinnate, the pinnæ and pinnules erecto-patent, alternate.

Apices blunt. *Articulations* of the pinnules twice or thrice as long as b cylindrical. *Favellæ* unknown. *Tetraspores* sessile, globose, solitary o sides of the uppermost pinnules, just below the apex. *Colour* a bea rose-red. *Substance* soft, but not gelatinous. It soon decomposes in water, giving out colour, and in drying most closely adheres to paper.

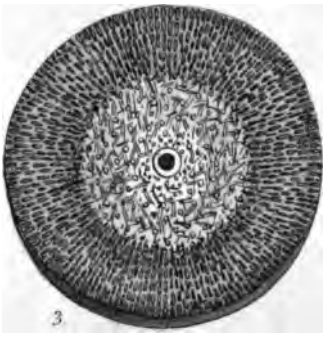
A truly beautiful species, even in the section (that of *C. seum*) of the beautiful genus to which it belongs. It is among the rarer of the Victorian species, if I may judge from few specimens I was myself able to secure, and from never ving received it from Dr. Mueller, or any other of my lib correspondents in Victoria. Its characters are so distinct, there is little need to compare it with any other. The like which it bears to *C. comosum* is an external one merely, microscopic characters being completely different, these spe belonging, indeed, to different sections of the genus. F *C. thuyoideum*, *C. gracillimum*, and others of similar aspect, opaque stem, coated with cells and rough with short sprea hairs, at once distinguishes it.

Fig. 1. CALLITHAMNION FORMOSUM,—*the natural size.* 2. Apex of a br with lateral plumules. 3. Apex of a plumule, bearing *tetraspores.* pinnule and tetraspore. 5. Cross section of the stem. 6. Small po of the stem :—*magnified.*

1.



2.



3.

Vincent Brooks, Imp

PLATE CCLXXXII.

ARESCHOUGIA? DUMOSA, *Harv.*

GEN. CHAR. *Frond* compressed or filiform, vaguely branched, composed of an articulated axile filament, and three (rarely but two) strata of cells; *medullary* stratum consisting of longitudinal, anastomosing, interwoven filaments; the *intermediate* (sometimes absent) of several rows of roundish, coloured cells; the *cortical* of minute, vertically seriated cellules. *Fructification:* 1, *conceptacles* immersed in the frond, very rarely external, suspended among the filaments of the medullary stratum, and enclosed in a network of filaments, opening by an external pore, and containing moniliform strings of spores, radiating from a central placenta; spores roundish; 2, zonate *tetraspores*, formed in the cortical stratum of the ramuli.—ARESCHOUGIA (*Harv.*), in honour of Dr. J. E. Areschoug, Professor of Botany at Upsal, a distinguished algologist.

Frons compressa v. filiformis, vage ramosa, immerse costata, e filo centrali articulato et stratis fere tribus cellularum constituta. Stratum medullare e filis articulatis longitudinalibus anastomosantibus intertextis; intermedium (nunc deficiens) e cellulis rotundatis majusculis pluriseriatis, corticale e cellulis minimis verticalibus formatum. Fruct.: 1, *cystocarpia fronde immersa rarissime externa, inter fila strati medullaris suspensa, reticulo filorum velata, carpostomio demum aperta, fila sporifera moniliformia a placenta centrali emissa continentia; sporæ subrotundæ;* 2, *tetrasporæ zonatim divisæ, inter cellulas corticales ramulorum nidulantes.*

ARESCHOUGIA *dumosa;* frond dendroid, bushy, terete; stem subundivided, alternately branched, the branches to all sides emitting slender, dichotomo-multifid, crowded, divaricating, obtuse ramuli; fruit . . . ?

A. dumosa; *fronde dendroidea dumosa tereti, caule simpliciusculo ramis alternis lateralibus onusto, ramis ramulos setaceos dichotomo-multifidos creberrimos divaricatos obtusos quoquoversum emittentibus; fructu . . . ?*

ARESCHOUGIA? dumosa, *Harv. MSS. in Herb. T.C.D.*

HAB. Cast ashore at Warnamboul, March, 1860, *H. Watts* (No. 122).

GEOGR. DISTR. South coast of Australia.

DESCR. *Root* unknown. *Frond* cylindrical, 2–3 inches long, and as much in the spread of the branches, densely bushy and excessively ramulous. *Stem* undivided, ½ line in diameter at base, slightly tapering upwards, throughout beset with horizontally patent, similar branches. *Branches* densely covered

with slender, divaricating, many times forked or irregularly multifid ramuli. These are ¼ to ½ inch long, as thick as bristles, irregularly intermixed, long and short together, and spreading to all sides. No *fructification* observed. The *colour* is a very dark, red-brown, becoming nearly black in drying. The *structure* is that proper to the genus, the peripheric layer being very largely developed. The *substance* is rigid, almost wiry when dry, in which state the plant does not adhere to paper.

The genus *Areschougia* bids fair to be an extensive one, if we may judge, not merely by the several species with which we are already acquainted, but by the extreme difference in aspect and habit that obtains between different members of the genus. Compare, for example, the three species already figured in this work (Plate XIII., CXVII., and CLXVI.) with the present Plate; and though there will be observed a similarity in *internal structure* of frond, there is not much else to indicate a bond of connection between them. What a number of "intermediate forms" it would take to connect by a series of small transitions the *A. australis* (Plate XIII.), on which the genus was originally founded, and our *A. dumosa* here figured. Possibly, however, for we do not yet know the *fruit* of *A. dumosa*, no such series exists or has existed, and the resemblance in cellular structure may be one of analogy and not of affinity. Assuredly I never was more surprised, on first examining Mr. Watts's specimen, than to find the cross cutting (Fig. 3) so completely similar to that of *A. sedoides* (Plate CXVII., Fig. 2) as to compel me to associate these plants in the same genus. I trust Mr. Watts may be so fortunate as to find specimens in fruit, and so to complete the history of this very distinct and curious Alga.

Fig. 1. ARESCHOUGIA DUMOSA,—*the natural size.* 2. Apex of a branch, with some of the multifid ramuli. 3. Transverse section of the same:—*magnified.*

Vincent Brooks, Imp

PLATE CCLXXXIII.

ACROPELTIS PHYLLOPHORA, *Hook.f.& Harv.*

GEN. CHAR. *Frond* stipitate, flat, imperfectly midribbed below, dichotomo-pinnatifid, distichous or proliferous, composed of three strata; the *medullary* of very slender, longitudinal, closely-packed filaments; the *intermediate* of roundish-angular cells; the *cortical* of minute, vertically seriated, coloured cells. *Fructification:* 1, simple, minute *favellæ*, crowded in apical sori, containing, within a hyaline envelope, a mass of roundish spores; 2, shield-like *nemathecia*, in the tips of the branches, containing cruciate tetraspores.—ACROPELTIS (*Mont.*), from *ακρος*, the *summit*, and *πελτη*, a *small shield;* alluding to the shield-like terminal sori and nemathecia.

Frons stipitata, plana, inferne obsolete costata, dichotomo-pinnatifida, disticha, v. prolifere ramosa, ex striatis tribus formata; stratum medullare ex filis tenuissimis creberrimis longitudinalibus, intermedium cellulis rotundato-angulatis, corticale cellulis minimis coloratis verticaliter seriatis constitutum. Fructus: 1 (*in* A. Phyllophora *tantum observatus*) *favellæ minimæ, simplices, soris terminalibus immersæ, intra periderma hyalinum sporas minutas rotundatas foventes;* 2, *nemathecia convexa, clypeiformia, infra apicem frondis evoluta, tetrasporas cruciatim divisas foventia.*

ACROPELTIS *Phyllophora;* stem plano-compressed, ribbed, branched; branches prolonged into broadly-flabelliform, many times dichotomous, fastigiate, rigidly membranaceous, basally costate fronds, frequently proliferous from the rib; segments linear-cuneate, patent; axils rounded.

A. Phyllophora; *caule plano-compresso costato ramoso; ramis in frondes lato-flabelliformes pluries dichotomas fastigiatas pergamenas basi costatas, sæpius e costa proliferas abeuntibus; laciniis lineari-cuneatis patentibus; axillis rotundatis.*

ACROPELTIS Phyllophora, *Hook.f. & Harv. in Hook. Lond. Journ. v.* 6. *p.* 407. *J. Ag. Sp. Alg. v.* 2. *p.* 611.

RHODYMENIA Phyllophora, *Harv. in Fl. Tasm. v.* 2. *p.* 319.

HAB. Port Arthur, Tasmania, *Dr. Jeannerett.* South Port, *C. Stuart.* Rottnest Island, West Australia, *W. H. H.*

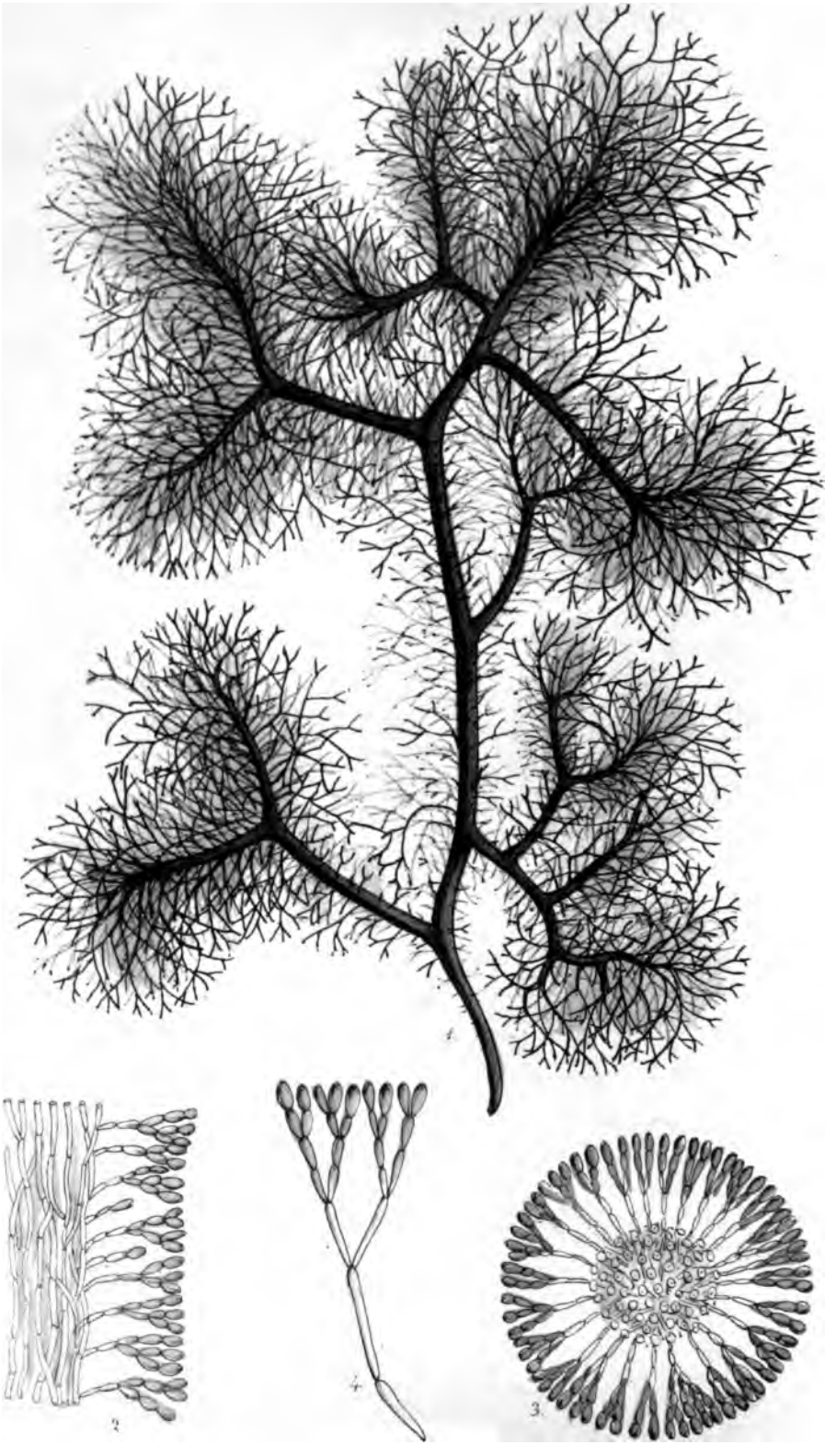
GEOGR. DISTR. West coast of Australia. Tasmania.

DESCR. *Root* a broad disc. *Frond* 6–12 inches high, and as much or more in the expansion of the segments. *Stem* 2–3 inches long, linear-cuneate, 1–3

lines wide, strongly ribbed, simple or once or twice branched, or throwing out from the midrib proliferous branches. *Branches* stipitate, the stipes strongly ribbed, the rib continued upwards into the lamina and vanishing; crowned with a flabelliform, many times forked, lamina, 3–5 inches long and wide. The *segments* are 3–4 lines wide, linear or slightly cuneate, flat and entire at margin, patent, with obtuse apices. *Fructification* of both kinds (on distinct individuals) is borne in the apices of the laciniæ. *Favellæ* very minute, many crowded together in a *sorus* which is 1–1½ lines in diameter, immersed, with a perfectly simple nucleus, breaking up at maturity into roundish spores. *Tetraspores* in shield-like, terminal nemathecia, cruciate. *Colour* a deep, rather dull, somewhat purplish red or pale vinous. *Substance* like that of parchment, rigid when dry. In drying, the frond does not in the least adhere to paper.

When writing the observations given under *Acropeltis elata* (Plate CXXII.), I was not aware that I possessed a specimen of *A. Phyllophora* bearing *cystocarps*, the want of a knowledge of which has hitherto prevented the proper classification of the genus. The *cystocarps* prove to have exactly the structure of those of *Cryptonemia*, next which genus *Acropeltis* (the Australian species at least) must now be placed. Indeed, in general habit and structure of frond there is so much agreement generically with *Cryptonemia*, especially with Agardh's section *Acrodiscus*, that I think these two genera might very properly be combined. For the present, however, I retain the name *Acropeltis* until the cystocarps of the original species and those of "*Acrodiscus*" shall have been observed.

Fig. 1. ACROPELTIS PHYLLOPHORA,—*the natural size.* 2. Apex of a branch containing a *sorus* of many *favellæ*. 3. Section through the same, showing some of the immersed favellæ. 4. Apex containing a shield-like *nemathecium*. 5. Section through the same, showing *tetraspores in situ*. 6. Two of the tetraspores: —*magnified.*



Vincent Brooke Imp

PLATE CCLXXXIV.

NEMALION? INSIGNE, *Harv.*

GEN. CHAR. *Frond* cylindrical, gelatinous, elastic, dichotomous, with a cord-like axis clothed with a continuous periphery of filaments invested in gelatine; the axis composed of long, subsimple, longitudinal, interlaced threads, surrounded by anastomosing threads, from which proceed the horizontal, dichotomous, fastigiate, moniliform, peripheric threads. *Fructification:* 1, *sporiferous nucleus* (*desmiocarp*) immersed among the peripheric threads, spherical, formed of many clavate spore-threads, radiating from a central point; 2, *tetraspores* formed in the terminal cells of the peripheric filaments, triangularly divided.—NEMALION (*Duby*), from νημα, a *thread*, and ληιον, a *crop*.

Frons teretiuscula, lubrica, dichotoma, axi filisque investientibus, stratum continuum periphericum formantibus, constituta; axi filis elongatis simpliciusculis in columnam medullarem intricatis, extra hanc sparsioribus, anastomosantibus, in fila peripherica horizontalia dichotoma fastigiata invicem libera oblique excurrentibus. Fruct.: 1, *desmiocarpia strato peripherico subimmersa, filis gemmidiiferis plurimis clavatis, a puncto centrali radiantibus, nudis constituta;* 2, *tetrasporæ in articulis terminalibus formatæ, triangule divisæ. J. Ag. Sp. Alg. v.* 2. *p.* 417.

NEMALION? *insigne;* main frond terete, robust, irregularly forked, the stem and branches to all sides emitting slender, many times dichotomous, divaricating ramuli; all the axils very wide.

N. insigne; *fronde primaria tereti robusta vage furcata, caule ramisque ramulos tenues pluries dichotomos divaricatos quoquoversum emittentibus; axillis obtusissimis.*

NEMALION insigne, *Harv. MS. in Herb. T. C. D.*

NEMASTOMA? densa, *Harv. Alg. Austr. Exsic. n.* 431. *Harv. in Hook. Fl. Tasm. v.* 2. *p.* 328.

HAB. On mudflats below Georgetown, in the Tamar, *Gunn, W. H. H.*

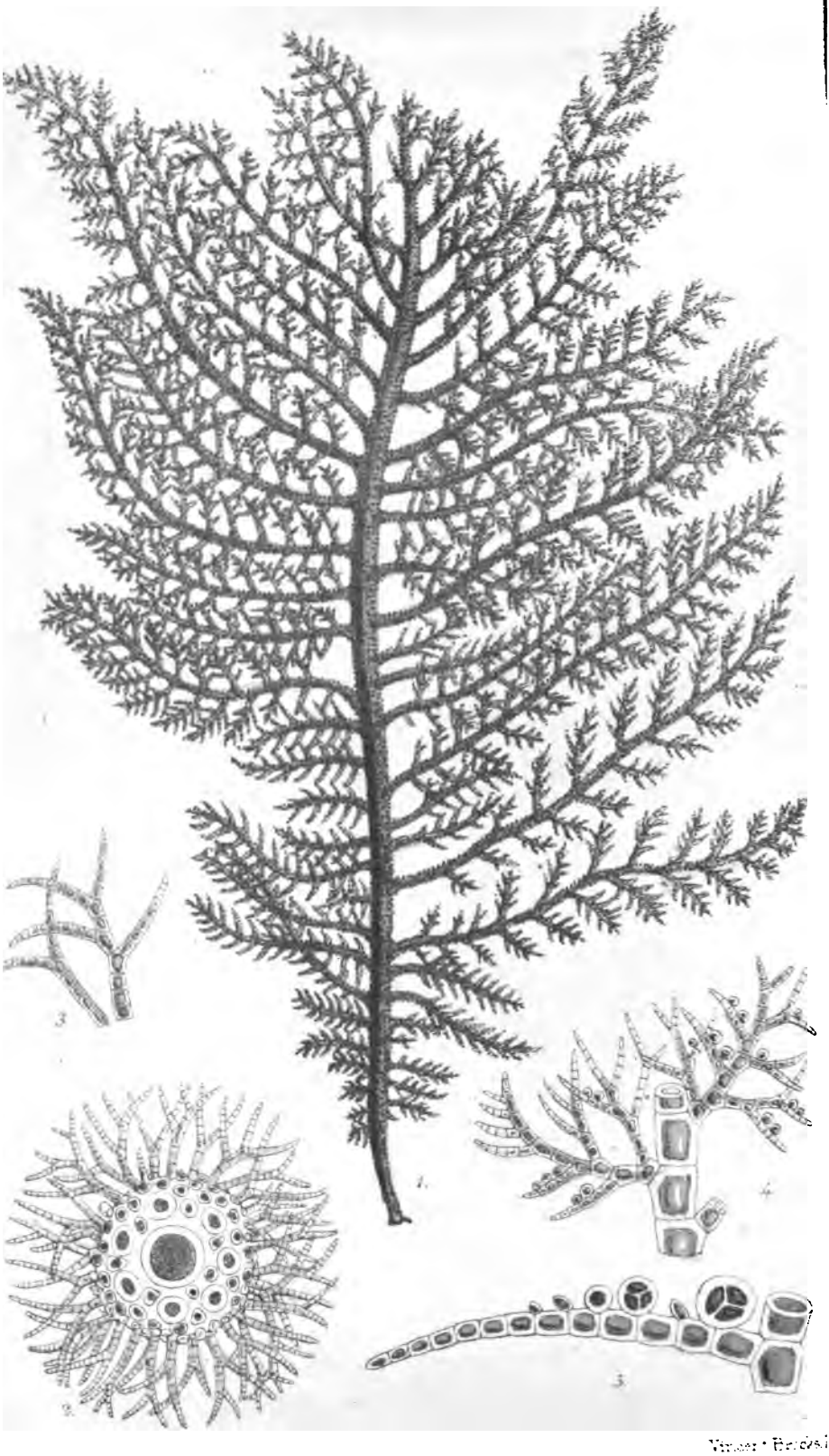
GEOGR. DISTR. Tasmania.

DESCR. *Root* a disc. *Frond* 6–8 inches long, and as much in the expansion of the branches, very bushy. *Stem* 1–1½ lines in diameter, terete, not much attenuate upward, simple or forked, furnished with a few, much-divaricated, once or twice forked branches. Both stem and branches are everywhere

closely beset with slender, many times forked, lateral ramuli. These spread towards all sides, are from ½ to 1½ inches long, of the thickness of bristles, divaricated, often intertwined, and forming a mop-like head. All the axils are remarkably wide and obtuse; the apices obtuse. No *fructification* has been observed. The *colour* is a very dark brown-red, becoming almost chocolate-colour in the dry state. *Substance* very soft, highly elastic, and lubricous. In drying, the frond most closely adheres to paper.

If future observation on the *fruit* (still unknown) of this curious Alga should induce any one to remove it generically from *Nemalion*, where, for want of a better position, I now place it, I suggest that the genus to be founded might appropriately bear the name of *Wiggia*, in honour of Mr. Lilly Wigg, "the friend and original instructor in this department of botany" of Dawson Turner, not merely because Mr. Wigg's memory deserves to be held in grateful remembrance by algologists, but because this plant is really very like a well-curled full-bottomed *wig!* Joking apart, I have been puzzled to know where to place this species. The original reference to *Nemastoma* I have long discarded. My inducement now to refer it to *Nemalion*, instead of to *Helminthocladia*, arises from the tendency to dichotomous ramification, here carried to an extreme excess. But if the frond only assimilated carbonate of lime in its tissues, the structure is sufficiently near that of *Liagora* to allow of a place in that genus. On the whole, I incline to think that the *fruit*, when found, may show that this puzzling customer is *sui generis*.

Fig. 1. NEMALIUM INSIGNE,—the *natural size*. 2. Longitudinal section, showing part of the fibrous axis and some peripheric threads. 3. Transverse section of a branch. 4. One of the peripheric threads:—*magnified*.



Vincent Brooks

PLATE CCLXXXV.

CALLITHAMNION PLUMIGERUM, *Harv.*

GEN. CHAR. *Frond* filiform, branched, articulated, monosiphonous, the stem and branches (in many species) at length thickened internally, or coated externally with decurrent filaments; ramuli always pellucidly articulate and monosiphonous. *Fructification:* 1, *favellæ* generally in pairs, axillary or sessile on the branches, naked, containing numerous angular spores; 2, *tetraspores* naked, sessile or pedicellate, distributed on the ramuli, generally triangularly parted.—CALLITHAMNION (*Lyngb.*), from καλλις, *beautiful,* and θαμνιον, *a little shrub.*

Frons filiformis, ramosa, articulata, monosiphonia, caule ramisque majoribus (in pluribus), demum fibris decurrentibus interne vel externe evolutis corticatis v. firmatis; ramulis semper pellucide articulatis. Fruct.: 1, *favellæ binatæ, axillares v. ad ramos sessiles, nudæ, sporas numerosas angulatas foventes;* 2, *tetrasporæ nudæ, ad ramulos sessiles v. pedicellatæ, triangule v. cruciatim divisæ.*

CALLITHAMNION *plumigerum;* frond rose-red, spongy, triply or quadruply pinnate, the pinnæ and pinnules densely covered with interwoven, articulated, longitudinal filaments, and hairy with minute, subsimple or forked ramelli; ultimate ramuli (or very young pinnules) free (not spongy), alternately plumulate; plumules minute, pinnato-multifid; favellæ in pairs, involucrate, sessile; tetraspores globose, secund on the divisions of the plumules.

C. plumigerum; *fronde rosea spongiosa 3–4-pinnata, pinnis pinnulisque filis longitudinalibus intertextis articulatis densissime velatis, et etiam ramellis minimis subramosis undique onustis quasi hirsutis, ramulis (v. pinnulis) junioribus liberis (non spongiosis) alterne plumulatis, plumulis minutis pinnato-multifidis; favellis binatis involucratis sessilibus; tetrasporis globosis ad pinnulas plumularum secundis sessilibus.*

CALLITHAMNION (Dasythamnion) plumigerum, *Harv. Alg. Austr. Exsicc. n.* 507.

HAB. Cape Liptrap, *Dr. F. Mueller.* Port Fairy and Western Port, *W. H. H.* Cape Shank, *Mrs. Barker.*

GEOGR. DISTR. South Coast of Australia.

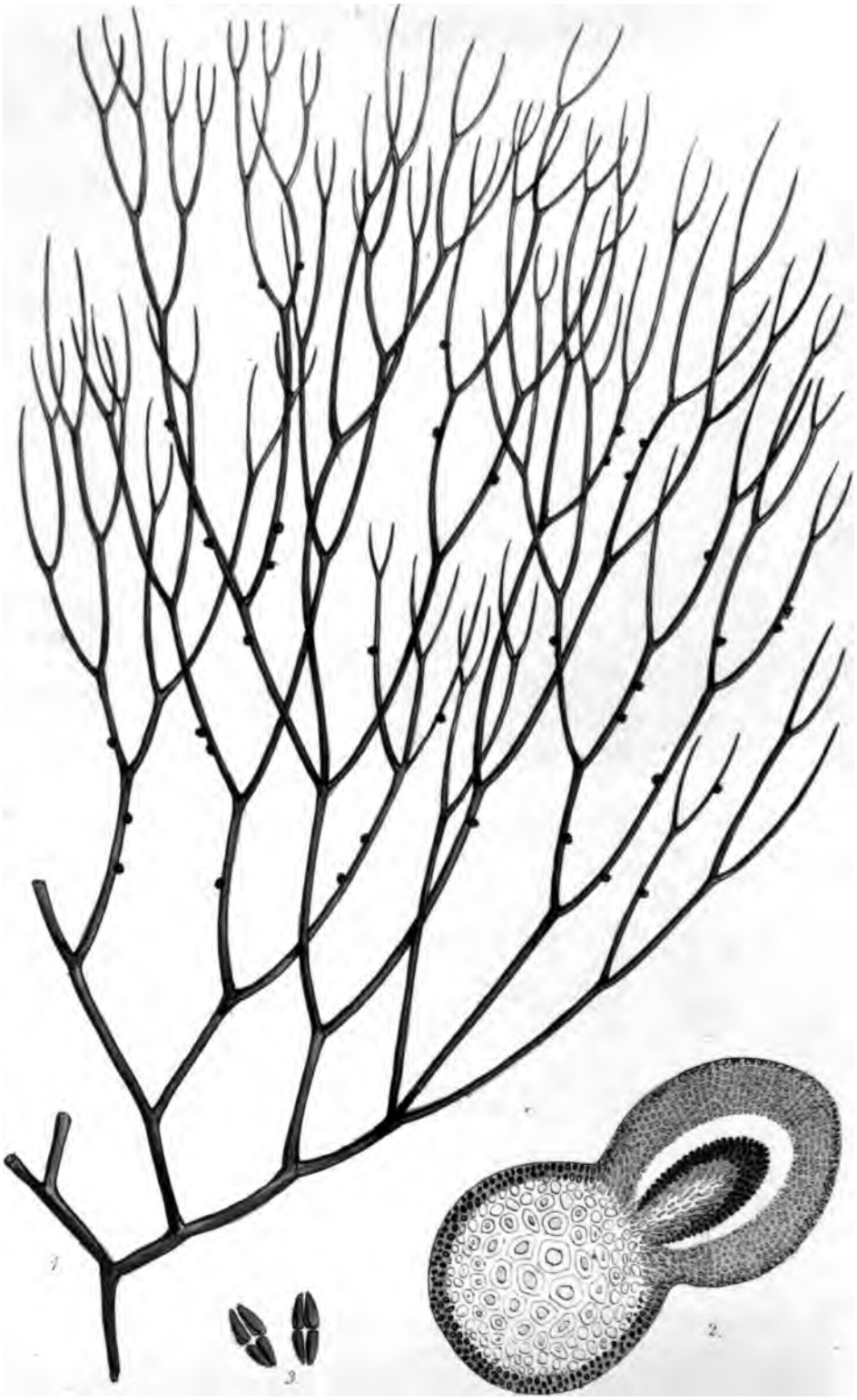
DESCR. *Root* covered with woolly fibres. *Frond* 3–4 times pinnated, of a soft, spongy texture, the primary, secondary, and tertiary pinnæ externally clothed with minute, horizontal, subsimple or alternately branched, jointed *hairs* or ramelli. These hairs spring from numerous longitudinal interwoven filaments, enclosing, as in a sheath, the proper or *primary* filamentous frond, which runs as a jointed axis through every portion of the spongy branches,

and issues at their extremities (or in the younger portions) where only it is externally visible. The *primary* filament has the structure of an ordinary *Callithamnion;* its naked tips (issuing from the ultimate pinnules of the compound frond) are set with alternate, subbipinnate or secundly multifid plumules, not more than 2–3 lines in length. *Favellæ* are hidden among the superficial hairs, which cluster round them as involucres; they are in pairs, and contain many spores. *Tetraspores* secund along the inner face of the divisions of the plumules. *Colour* a rosy red, somewhat purplish, soon discharged in fresh water. *Substance* soft, flaccid. In drying, the frond closely adheres to paper.

This species has quite the aspect of a *Ptilocladia*, but not the microscopic structure; and notwithstanding the very copious and closely implicated filaments which clothe the stem and branches, and all parts save the ultimate ramuli, I am unwilling to separate it generically from *Callithamnion*, in which genus various other Australian species of the section *Dasythamnion* are closely related to it, although perhaps it departs most widely from the ordinary habit of the genus.

Though found in several places, it seems to be of rare occurrence. The *favellæ*, which were not known to me when the figure was prepared, are copiously found on a specimen recently received from Mrs. Barker.

Fig. 1. CALLITHAMNION PLUMIGERUM,—*the natural size.* 2. Section through the spongy frond, showing the central filament and its surrounding accessories, with the peripheric hairs. 3. Some of the hairs. 4. A pair of plumules. 5. One of their pinnules, with *tetraspores;* the latter figure *magnified.*



Vincent Brooks Imp

PLATE CCLXXXVI.

GRACILARIA FURCELLATA, *Mont.*

GEN. CHAR. *Frond* filiform, compressed, or flat, cartilaginous, irregularly branched, composed of two strata; the medullary stratum of large, roundish, angular cells, smaller outwards, usually containing granules; the cortical of minute cellules, vertically seriated or in a single row. *Fructification:* 1, hemispherical or conoidal conceptacles, sessile on the branches, containing within a thick pericarp obovate *spores* arranged in spore-threads issuing from a basal placenta; 2, *tetraspores* cruciate or tripartite, dispersed among the surface-cellules of the branches and ramuli.—GRACILARIA (*Grev.*), from *gracilis*, 'slender;' applicable to the filiform species.

Frons filiformis, compressa, v. plana, carnoso-cartilaginea, vage ramosa, ex stratis duobus contexta. Stratum medullare cellulis magnis rotundato-angulatis, exterioribus sensim minoribus, materie granulosa sæpe repletis; corticale cellulis minimis uni- v. pluri-seriatis. Fruct.: 1, *conceptacula hemisphærica, sessilia, intra pericarpium crassum fila sporifera e placenta basali radiantia foventia;* 2, *tetrasporæ sparsæ, cruciatim divisæ.*

GRACILARIA *furcellata;* frond softly cartilaginous, terete, attenuated upwards, many times forked, fastigiate; cystocarps roundish-ovate, sessile, scattered.

G. furcellata; *fronde cartilaginea flaccida tereti sursum attenuata pluries dichotoma fastigiata, cystocarpiis ovatis sessilibus sparsis.*

GRACILARIA furcellata, *Mont. in Herb. T. C. D.*

PLOCARIA furcellata, *Mont. Alg. Yem. n.* 12. *Sylloge, p.* 413.

HAB. Fremantle beach, *W. H. H., G. Clifton.*

GEOGR. DISTR. Red Sea.

DESCR. *Root?* *Frond* 6–12 inches long, and as much or more in the expansion of the branches, nearly a line in diameter at the base, not a quarter of a line in the middle, and scarcely more than setaceous at the attenuated apices, pretty regularly forked throughout, and having a well-defined general outline, the branches, when displayed, lying in a semicircle, all their tips of nearly equal length. The lower axils are near together and very patent, the upper more distant and acute; the ultimate divisions are usually long, filiform, and very acute. *Cystocarps* are abundantly scattered along the branches; they are sometimes opposite, more usually secund, very prominent, subglobose or ovate. *Tetraspores* cruciate, immersed in the frond. The *colour* is a dark, somewhat purplish red, becoming darker in drying.

The *substance* in the lower part of the frond is rather rigid, somewhat horny when dry; in the upper part it is flaccid and soft, but cartilaginous. In drying, all but the bases of the old branches adhere pretty closely to paper.

From *G. confervoides*, to some varieties of which this seems to be nearly related, our plant differs in its softer and much more flaccid substance, and especially in the more regularly dichotomous ramification and the circumscribed or fastigiate general outline. I have received many West Australian specimens, all of them preserving the same general aspect. The only Australian Alga with which it is likely to be confounded is *Dicranema filiforme*, Sond., a native also of Fremantle, and closely resembling it in size and ramification, but differing in structure and fruit.

Fig. 1. GRACILARIA FURCELLATA,—*the natural size.* 2. Section of branch and cystocarp. 3. Tetraspores:—*magnified.*

PLATE CCLXXXVII.

WRANGELIA CLAVIGERA, *Harv.*

GEN. CHAR. *Frond* filiform, decompound, articulated, one-tubed; the *internodes* naked or coated with minute cellules; the *nodes* clothed with opposite or whorled articulated ramelli. *Fructification:* 1, *cystocarps* terminating short branches, involucrated by the uppermost, whorled ramelli, and consisting of tufts of pear-shaped pedicellate *spores* and slender *paranemata;* 2, naked, triangularly parted *tetraspores,* borne on the sides of the whorled ramelli.—WRANGELIA (*Ag.*), in honour of Baron v. Wrangel, a Swedish naturalist.

Frons filiformis, decomposita, articulata, monosiphonia, nuda v. cellulis corticata, verticillis ramellorum ad genicula onusta. Fruct.: 1, *cystocarpia ramos terminantia, ramellis supremis involucrata, fasciculis numerosis sporarum pyriformium pedicellatarum et paranematibus tenuibus constantia;* 2, *tetrasporæ nudæ, triangule divisæ, ad ramellos sessiles.*

WRANGELIA *clavigera;* frond cartilaginous, corticated, decompound-pinnate, pinnæ and pinnulæ alternate, spreading, throughout densely whorled with imbricating multifid ramelli, the younger branches club-shaped (in outline); ramelli alternately pinnato-multifid, the apices acute; articulations 2–3 times as long as broad; cystocarps terminating short, club-shaped, hirsute pinnules.

W. clavigera; *fronde cartilaginea corticate decomposite-pinnata, pinnis pinnulisque alternis patentibus quasi hirsutis, densissime ramellis multifidis verticillatis imbricatis velatis, pinnis junioribus clavæformibus; ramellis alterne pinnato-multifidis, apicibus acutis; articulis ramellorum diametro* 2–3-*plo longioribus; cystocarpiis pinnulas pusillas clavatas hirsutas terminantibus.*

WRANGELIA clavigera, *Harv. Alg. Exsic. Austr. n.* 268.

HAB. Spencer's Gulf, *Dr. F. Mueller.* Port Fairy, Port Philip Heads, and Western Port, *W. H. H.* Warnamboul, *H. Watts,* 48,209. Macdonnell Bay, *Rev. J. E. Wood.*

GEOGR. DISTR. South Coast of Australia.

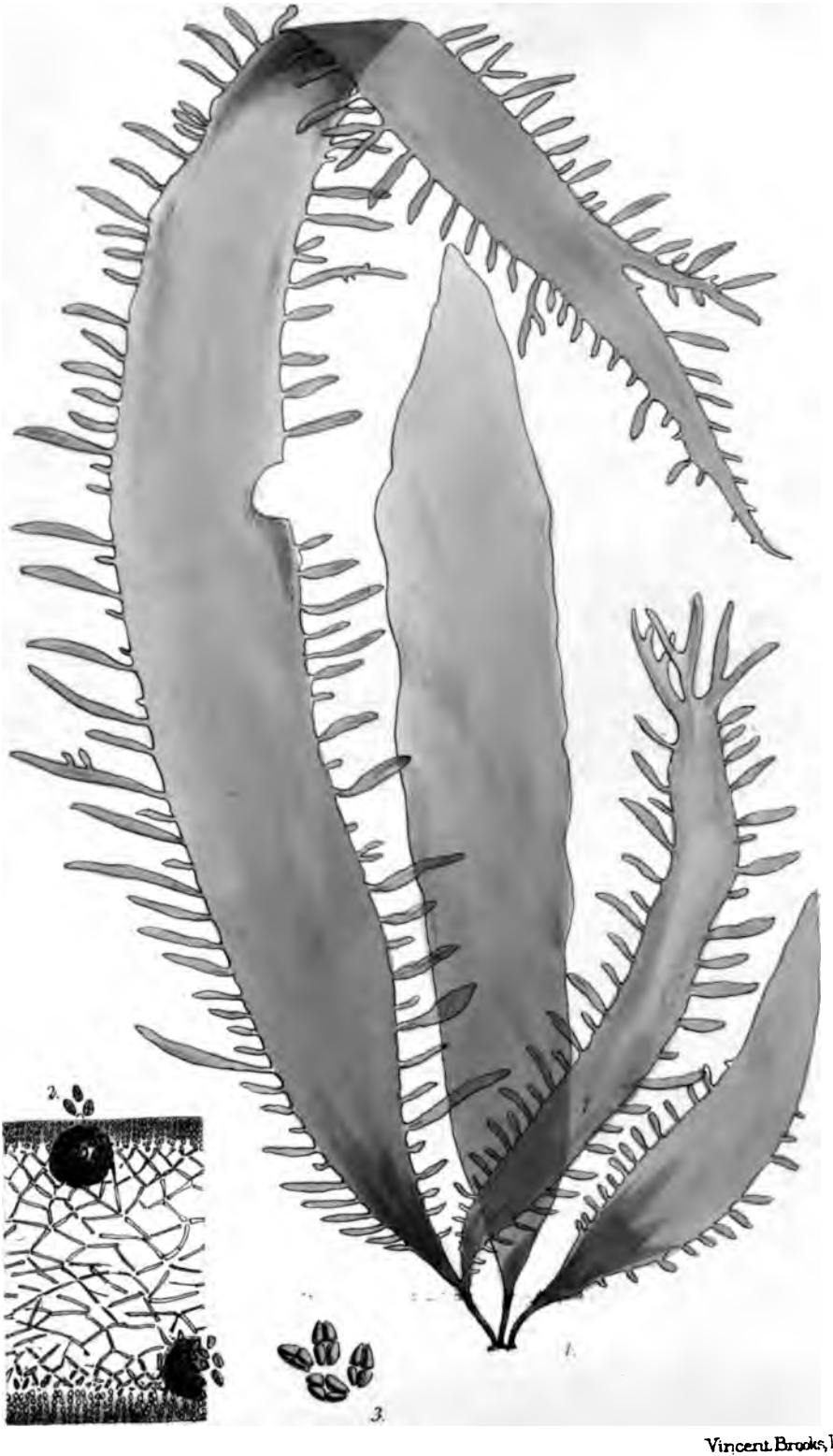
DESCR. *Root* clothed with woolly fibres. *Frond* 6–12 inches long, and as much in the spread of the branches, either once, twice, or thrice alternately or irregularly pinnate; the main stems mostly simple, sometimes forked; the primary pinnæ very widely spreading, closely set, of unequal length, long and short intermixed, the longer ones again pinnated. All parts of the frond, except those which are worn by age and exposure, are densely

clothed with short, whorled ramelli, so as to appear shaggy; on the young branchlets the lowermost ramelli are short, the upper gradually longer, and as they lie closely (*imbricating*) they give to the branchlet the aspect of a club. The ramelli, when well developed, are alternately multifid pinnate in their upper, bi-tripinnate in their lower half; the tips are acute, but not acuminate; the joints short. *Cystocarps* are found on very short, club-shaped pinnules or branchlets, issuing irregularly from the larger pinnules, which they resemble in structure and aspect; the spores are mixed with innumerable paranemata. *Tetraspores* have not been observed. The *colour* is a brownish-red, becoming darker in the herbarium. The *substance* is rather rigid in the main stem, but very soft in the ramelli; and in drying, the frond closely adheres to paper.

Nearly related to the Tasmanian *W. nobilis*, to which in its denuded state it bears a very close resemblance, but from which, when in vigour, this is known by the strictly club-shaped branchlets, and their closely imbricating ramelli.

Our plate has unfortunately been struck in too pale and too red an ink.

Fig. 1. WRANGELIA CLAVIGERA,—*the natural size.* 2. A ramellus. 3. One of the short, club-like fruit branches, bearing a terminal cystocarp. 4 Spores and paranemata from the cystocarp :—*magnified.*



Vincent Brooks, Imp

PLATE CCLXXXVIII.

GIGARTINA LANCEOLATA, *Harv.*

GEN. CHAR. *Frond* carnoso-cartilaginous, flat or cylindrical, simple or variously branched, composed of two strata of cells; the medullary stratum, of cylindrical, articulated filaments, anastomosing into a very lax network; the cortical, of moniliform, vertical, dichotomous filaments set in firm gelatine. *Fructification:* 1, external, globose, finally perforate *conceptacles,* containing within a saccate *placenta* (?) formed of closely interwoven filaments, a compound *nucleus* consisting of many confluent *nucleoli,* or masses of roundish-angular spores; 2, cruciate *tetraspores,* collected into dense, subprominent sori, lodged beneath the superficial cells.—GIGARTINA (*Lamour.*), from γιγαρτον, *a grape-stone,* which the conceptacles resemble.

Frons carnoso-cartilaginea, plana v. cylindracea, ramosa, ex stratis duobus cellularum composita; stratum medullare ex filis tenuibus cylindraceis laxe anastomosantibus, corticale ex filis moniliformibus verticalibus dichotomis formatum. Fruct.: 1, *favillidia intra pericarpium externum carpostomio pertusum excepta, filis arachnoideis intertextis obvoluta;* 2, *tetrasporæ cruciatim divisæ, in soros subprominentes infra stratum corticale nidulantes plurimæ collectæ.*

GIGARTINA *lanceolata;* frond rising from a short, scarcely channelled stipes, flat, fleshy, lanceolate or oblong-obovate, simple, or divided into several similar fronds; margin plane, naked or more frequently pinnato-ciliate; cilia subulate, horizontal; sori of tetraspores globose, punctiform, immersed in the smooth disc of the frond.

G. lanceolata; *fronde e stipite brevi vix canaliculato oriente plana carnosa lanceolata v. oblongo-obovata simplici v. in frondes plures consimiles partita, margine ruda v. sæpius plus minus pinnato-ciliata, ciliis subulatis horizontalibus; soris tetrasporarum punctiformibus per laminam lævem sparsis immersis.*

GIGARTINA lanceolata, *Harv. in Fl. Tasm. v.* 2. *p.* 326.

HAB. Georgetown, *R. Gunn.*

GEOGR. DISTR. Tasmania.

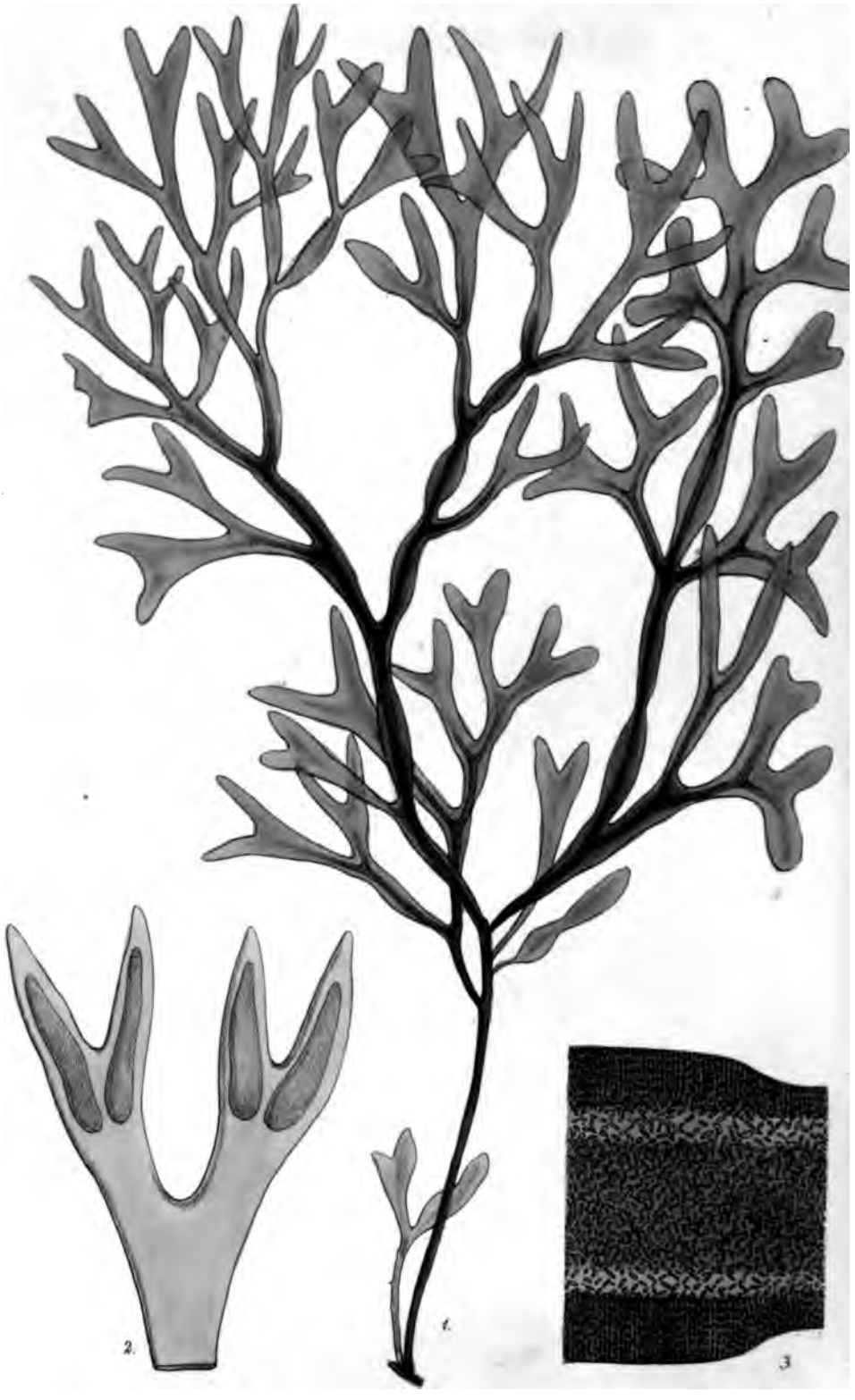
DESCR. *Root* a small disc. *Fronds* one or many from the same base, shortly stipitate, the stipes $\frac{1}{4}$–$\frac{1}{2}$ inch long, somewhat channelled, compressed and widening upwards, and gradually expanding into the cuneate base of the lamina; lamina lanceolate or obovate-oblong, either subacute, acute, or acuminate, mostly quite simple, but sometimes branching near the base, the branches lanceolate as the simple fronds. The surface is flat and quite

smooth; the margin is either quite entire and naked, or more frequently it is pinnated with linear-lanceolate or subulate processes. These *pinnæ* are ½–1 inch long, 1–1½ line wide, patent, and subacute, mostly quite simple. No *cystocarps* have been observed. *Tetraspores* cruciate, in minute, dot-like, deep-red sori, immersed in the cortical layer of the frond. The *colour* is a pale brownish-red, deeper below, and changing to orange and yellow. The *substance* is rigid and tough, somewhat leathery. In drying, the frond scarcely adheres to paper, except after long steeping and under considerable pressure.

Some doubt must rest on this species until its *cystocarps* shall have been discovered. Meanwhile our figure may direct attention to it from our friends in Tasmania, where it seems to be not uncommon. Some forms of it may be confounded with *Rhodymenia polymorpha*, but an appeal to the microscopic structure of the frond will enable the student to ascertain to which of these externally similar plants his specimens should be referred.

No other Australian Alga can well be mistaken for it.

Fig. 1. GIGARTINA LANCEOLATA,—*the natural size.* 2. Section of the frond, showing two immersed *sori* of tetraspores. 3. Tetraspores from the same, —*magnified.*



Vincent Brooks, Imp.

PLATE CCLXXXIX.

CRYPTONEMIA? DECIPIENS, *Harv.*

GEN. CHAR. *Frond* flat, rigid, caulescent, proliferous and branched, formed of three strata; the *medullary* stratum of longitudinal, slender, closely interwoven filaments; the *intermediate* of roundish cells; the cortical of minute cellules. *Fructification:* 1, simple *favellæ*, immersed in the substance of the frond; 2, cruciate *tetraspores*, collected in roundish sori, either under the apices, or in special fruit-leaves.—CRYPTONEMIA (*J. Ag.*), from *κρυπτω, to hide*, and *νημα, a thread;* alluding to the hidden threads of the medullary stratum.

Frons plana, chartacea, caulescens, prolifera et ramosa, stratis fere tribus contexta; strato medullari filis elongatis longitudinalibus tenuibus dense intertextis, intermedio cellulis rotundatis majusculis, corticali cellulis minimis constante. Fruct.: 1, *favellæ simplices, in frondem immersæ;* 2, *tetrasporæ cruciatim divisæ, in soros rotundatos collectæ, soris infra apices aut in sporophyllis propriis positis.*

CRYPTONEMIA? *decipiens;* stipes filiform, elongate, continued as a strong midrib into the lower segments of the frond; frond many times dichotomous, flabelliform, fastigiate, rigidly coriaceous or horny; segments narrow-cuneate, flat, spreading, obtuse, with wide axils; sori (young) in the apices.

C. decipiens; *stipite filiformi, elongato, sursum in frondem ut costa ramosa valida longe producto, fronde pluries dichotome flabelliformi fastigiata rigide coriacea v. cornea, laciniis anguste cuneatis planis patentibus obtusis, axillis latis, soris (junioribus) sub apicibus laciniarum, oblongis.*

CRYPTONEMIA decipiens, *Harv. in Herb. T. C. D.*

HAB. Rottnest Island, Fremantle, *W. H. H., G. Clifton.*

GEOGR. DISTR. West Australia.

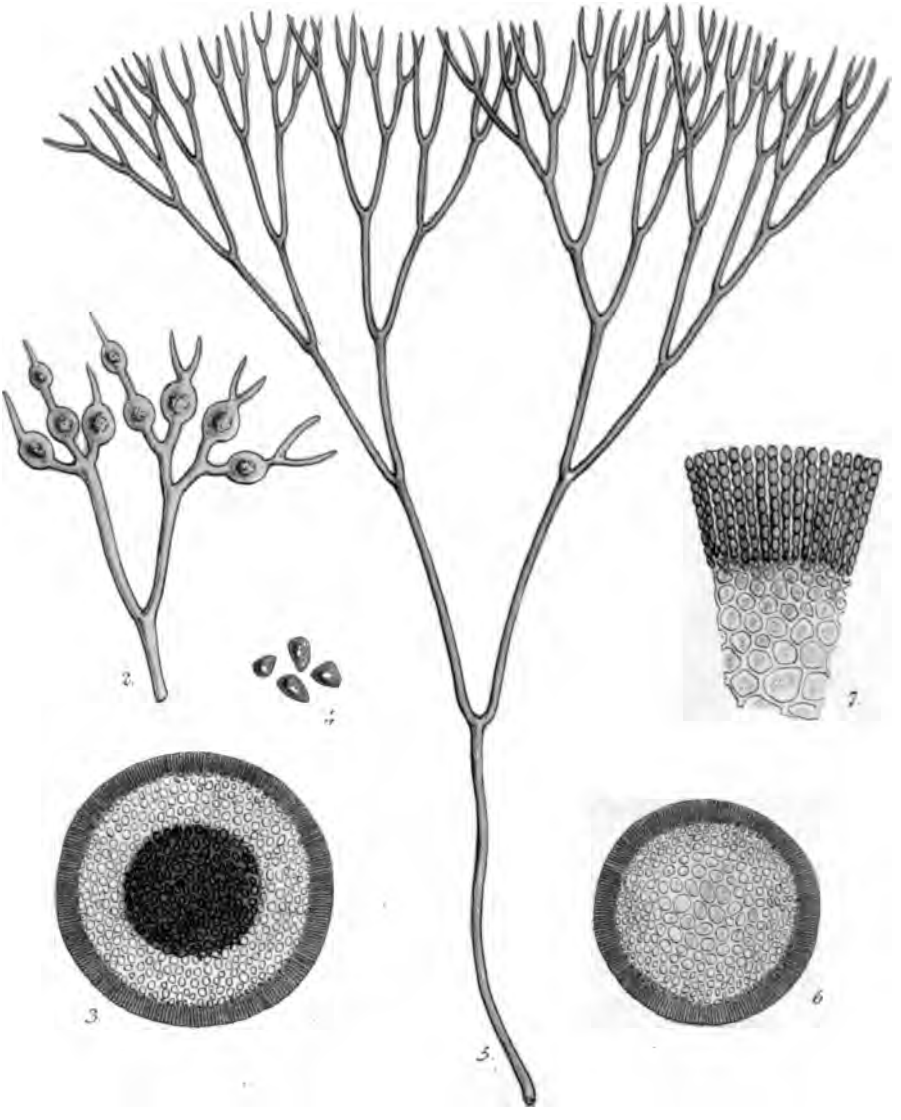
DESCR. *Root* a small disc. *Stipes* 2–3 inches long, half a line in diameter, very rigid and wiry, terete, passing into the base of the frond as a midrib, then branching, and prolonged for 2–4 inches or more through the principal segments, till it disappears near the summit. *Frond* flabelliform in outline, very much divided in an irregularly dichotomous manner, 6–8 inches long, and as much or more in the spread of the branches. *Segments* linear or linear-cuneate, constricted at intervals, quite flat, the lateral ones repeatedly forked; axils all wide and blunt; apices obtuse. No mature fruit has been seen, but in several apices occur oblong thickenings of the peripheric stratum, like young *nemathecia*, and doubtless these are preparations for sori of tetraspores. The *structure* of the frond is very dense, the *medullary* region

and what exists of an *intermediate*, composed wholly of closely interlacing and anastomosing filaments; the cortical of vertically seriated cellules, in many rows. The *colour* is a deep purplish-red; the surface glossy, and both preserved in drying. The *substance* is thickish, very tough, rigid, horny when dry, in which state the frond does not in the least adhere to paper.

This plant bears so close a resemblance externally to our *Acropeltis Phyllophora* (Plate CCLXXXIII.), that I formerly confounded it with that species, and may very probably have erroneously distributed it, under that name, among my Australian duplicates. Both plants were gathered at the same place and time, and dried and stowed away together. It was not until I commenced dissections for preparing a plate of the *Acropeltis*, that I noticed the confusion. A glance at the section (fig. 3 in our present Plate) and comparison with the sections (figs. 3, 5, Plate CCLXXXIII.) of *Acropeltis Phyllophora*, will show the differences in cellular structure, which remove the present plant, generically, from *Acropeltis*. In now referring it to *Cryptonemia*, I must be understood to do so provisionally, until the discovery of its fruit enable us to assign it its proper place in the system.

Fig. 1. CRYPTONEMIA? DECIPIENS,—*the natural size.* 2. Apices of a segment, with *young* sori. 3. Section through the frond:—*magnified.*

1.



Vincent Brooks Imp

PLATE CCXC.

GYMNOGONGRUS FASTIGIATUS, *Harv.*

GEN. CHAR. *Frond* coriaceous, somewhat fleshy, nearly filiform or flat, dichotomous, fastigiate, formed of two strata of cells; the *medullary* stratum of roundish-angular cells, the *cortical* of moniliform, vertical filaments, set in gelatine. *Fructification:* 1, immersed *conceptacles*, more or less prominent, composed of several nucleoli of spores aggregated in a compound nucleus; 2, external *nemathecia* (or warts), formed of radiating filaments, whose cells at maturity are changed into cruciate tetraspores.—GYMNOGONGRUS (*Mart.*), from γυμνος, *naked*, and γογγρος, *a wart-like excrescence on trees.*

Frons carnoso-coriacea, teretiuscula aut plana, dichotomo-fastigiata, stratis duobus cellularum constituta; strato medullari cellulis rotundato-angulatis, corticali filis moniliformibus verticalibus muco cohibitis contexto. Fruct.: 1, *cystocarpia immersa, plus minus prominentia, clausa, nucleolis sporarum pluribus in nucleum compositum aggregatis constantia;* 2, *nemathecia externa, filis radiantibus demum in tetrasporas cruciatas solutis constituta.*

GYMNOGONGRUS *fastigiatus;* frond dwarf, filiform or a little compressed, dichotomously much branched, fastigiate, flabelliform; branches and ramuli close, tapering to the apex, subacute; axils obtuse; cystocarps below the tips of the ramuli, forming round swellings prominent to every side.

G. fastigiatus; *fronde pusilla filiformi v. parum compressa dichotome ramosissima fastigiata flabelliformi, ramis ramulisque densis apice attenuatis subacutis, axillis obtusis, cystocarpiis infra apices ramulorum nodoso-incrassatos immersis circumcirca prominentibus.*

GYMNOGONGRUS fastigiatus, *Harv. in Hook. Fl. Tasm. v.* 2. *p.* 322.

HAB. On granite rocks, at half-tide, Forester's River, Tasmania, *R. Gunn.*

GEOGR. DISTR. Tasmania.

DESCR. *Root* a small disc. *Fronds* densely tufted, 1–1½ inches high, scarcely as thick as bristle, many times dichotomous, the segments spreading like a fan, and fastigiate, erecto-patent, acute. The axils throughout the frond are blunt, though narrow. *Cystocarps* are abundantly produced on our specimens; they occur either solitary or in pairs in the uppermost ramuli, forming knot-like swellings in the ramulus about thrice the diameter of the part where they occur. The *nucleus* is very dense, consisting of minute spores. The *colour* is a dark and dull reddish-brown, becoming browner in drying and horny on exposure to weather. *Substance* very rigid, horny when dry. The frond does not in the least adhere to paper in drying.

A minute but neat-growing species, as yet only found by Mr. Gunn in the locality above given. There it is probably not uncommon, Mr. Gunn having secured a good handful of specimens, many of which were covered with fruit. Its characters are well marked, and it is not likely to be mistaken for any Australian Alga as yet known.

Fig. 1. GYMNOGONGRUS FASTIGIATUS,—*the natural size.* 2. Portion of the fertile frond. 3. Cross-section through a cystocarp. 4. Spores from the same. 5. Portion of a barren frond. 6. Cross-section of the same. 7. Portion of the same section, enlarged:—*variously magnified.*

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PLATE CCXCI.

CROUANIA WATTSII, *Harv.*

GEN. CHAR. *Frond* nodoso-articulate, alternately decompound, consisting of an articulate, monosiphonous, primary filament (or *axis*) emitting at the nodes densely whorled, minute, dichotomo-fastigiate, free, articulated ramelli. *Fructification:* 1, solitary subterminal *favellæ*, surrounded by ramelli; 2, external triangularly-parted *tetraspores*, borne on the ramelli.—CROUANIA (*J. Ag.*), in honour of the brothers *Crouan*, of Brest, celebrated among French Phycologists.

Frons nodoso-articulata, alterne decomposita, e filo primario (axi) monosiphonio articulato ramellos minutissimos dichotomo-fastigiatos articulatos verticillatos ex nodis emittente constituta. Fruct.: 1, *favellæ subterminales, solitariæ, inter ramellos absconditæ;* 2, *tetrasporæ triangule aut transversim divisæ, ad ramellos lateraliter affixæ.*

CROUANIA *Wattsii;* frond cartilaginous, thickly corticated throughout, opaque, distichously bi-tri-pinnate; pinnæ and pinnules alternate, close, horizontally spreading, whorled at the nodes with minute, dichotomo-multifid, four-ranked, articulated, mucronate ramelli; articulations of the ramelli one and a half as long as broad; tetraspores globose, sessile.

C. Wattsii; *fronde cartilaginea strato cellularum crasso-corticata opaca distiche bi-tripinnata; pinnis pinnulisque alternis crebris horizontaliter patentibus ad genicula verticillatim ramellosis, ramellis minutis dichotomo-multifidis tetrastichis articulatis mucronatis, articulis ramellorum diametro sesquilongioribus, tetrasporis globosis sessilibus.*

CROUANIA Wattsii, *Harv. in Herb. T. C. D.*

HAB. Cast ashore at Warnamboul, rare, *H. Watts, n.* 221.

GEOGR. DISTR. South coast of Australia.

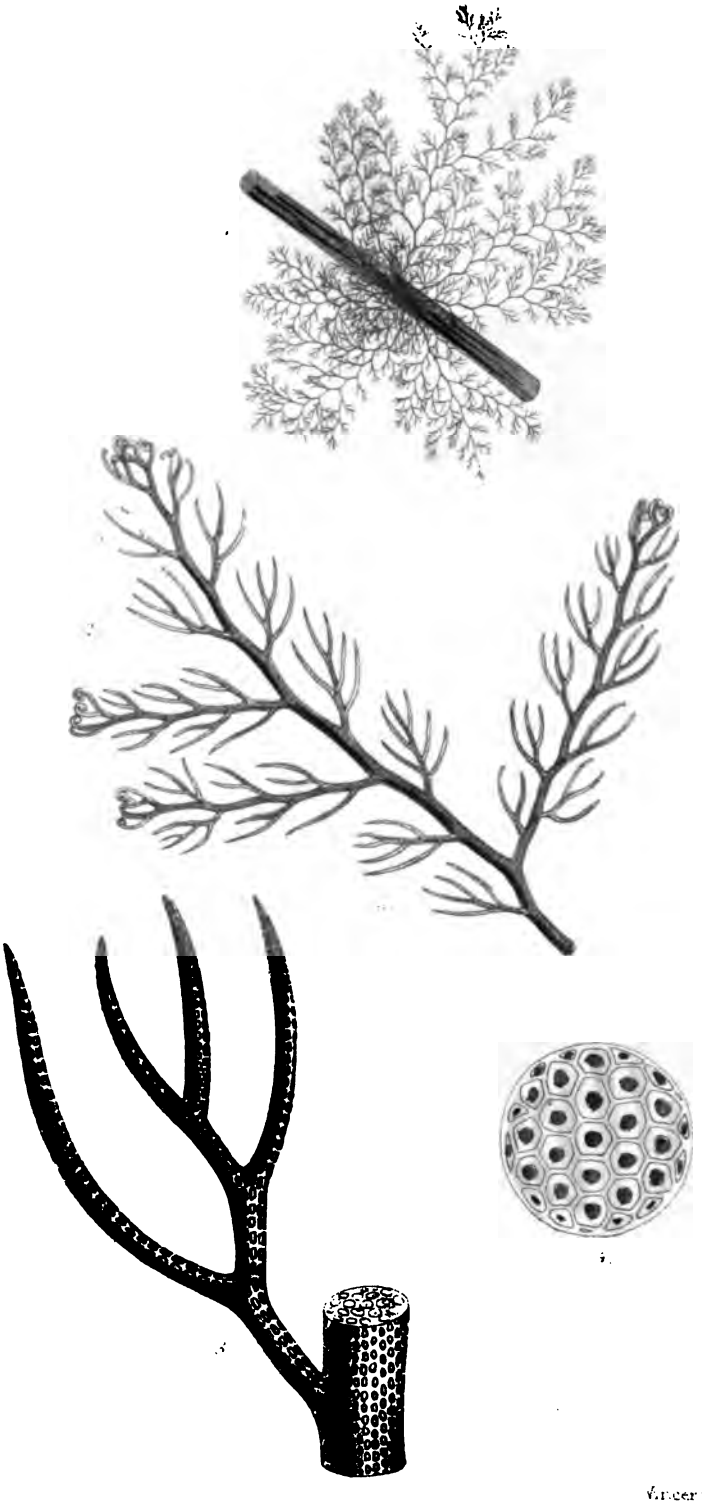
DESCR. *Root* not seen. *Frond* 2–3 inches long, about 2 inches in the spread of the branches, perfectly distichous, with a pyramidal outline, the lowest branches being longest and most compound, the upper gradually shorter. Principal *stem* undivided, percurrent, closely pinnated throughout with alternate, horizontal, lateral branches, opposite the base of which is frequently developed a small simple or pinnulated ramulus. *Branches* (or *pinnæ*) bare of pinnulæ at base for nearly one-third of their length, thence to the summit closely pinnulated or bipinnulated, the larger most compound, the uppermost scarcely pinnulated save just at the summit. Every part of the frond is closely whorled with minute quadrifarious ramelli, the whorls touching or nearly touching. These *ramelli* are bipartite, each half many times dicho-

tomous, and each ramification tipped with a minute cellule or mucro. The branches, pinnæ, and pinnules are all opaque, being corticated with a layer of cellules, which is thickest in the oldest parts. *Favellæ* unknown. *Tetraspores* globose, sessile near the tips of the ramelli. *Colour* a full, deep red. *Substance* rather cartilaginous, soft, but not sensibly gelatinous. In drying, the frond adheres closely to paper.

Though as yet I have only seen a solitary specimen of this Alga, I venture to consider it as the type of a new species, nearly allied indeed to *C. Agardhiana* (Plate CCLVI.), but differing greatly in ramification and general habit, and more critically distinguishable by the mucronate apices of the ramelli. Like *C. Agardhiana,* we have here a species with an opaque, corticated axis, presenting all other characters proper to *Crouania;* in the present species only the *tetraspores* are known, and in *C. Agardhiana* only the *favellæ;* thus, if these two species may be regarded as congeners, one supplements the other in its fructification.

I am glad to have this opportunity, before closing the 'Phycologia,' again to express my obligations to Mr. Henry Watts, of Warnamboul, the discoverer of this pretty little plant, for a considerable number of the rarer Algæ of that shore, communicated to me at intervals during the last three or four years.

Fig. 1. CROUANIA WATTSII,—*the natural size.* 2. One of the pinnules, whorled with ramelli. 3. Cross-section of the pinnule, through one of the whorls. 4. Part of a ramellus. 5. A tetraspore from the same. 6. Cross-section of a branch :—*variously magnified.*



Vincent Brooks

PLATE CCXCII.

BOSTRYCHIA HARVEYI, *Mont.*

GEN. CHAR. *Frond* filiform, pinnately branched, inarticulate (or subarticulate with very short internodes), tessellated with quadrate or hexagonal cells; *axis* tubular, articulated, surrounded by one or more concentric rows of coloured cells. *Ramuli* hook-pointed. *Fructification:* 1, ovate, terminal *ceramidia,* containing a tuft of pear-shaped spores; 2, fusiform, terminal *stichidia,* containing a double row of tetraspores.—BOSTRYCHIA (*Mont.*), from *βοστρυχος, a ringlet* or *curl of hair.*

Frons filiformis, pinnatim ramosa, inarticulata (v. vix articulata articulis brevissimis) cellulis hexagonis v. quadratis corticata. Axis tubulosus, articulatus, monosiphonius, cellulis uni-pluriseriatis endochromaticis superficiem versus brevioribus circumdatus. Ramuli sæpissime involuti v. uncinati. Fruct.: 1, ceramidia ovata, terminalia, fasciculum sporarum pyriformium continentia; 2, stichidia terminalia, fusiformia, tetrasporas biseriatas foventia.

BOSTRYCHIA *Harveyi;* stems (bi-tri-uncial) capillary, bi-tri-pinnate, flexuous; pinnæ distichous, alternate, patent, pinnules 2–3-fid or alternately or subdichotomously multifid, the terminal ones strongly inrolled; surface throughout dotted with minute, quadrate cells; axile cells in several rows.

B. Harveyi; *caulibus (2–3-uncialibus) capillaribus bi-tri-pinnatis flexuosis, pinnis distichis alternis patentibus, pinnulis 2–3-fidis v. alterne v. subdichotome plurifidis, terminalibus involutis, cellulis superficialibus minutis quadratis numerosis, axilibus pluriseriatis.*

BOSTRYCHIA Harveyi, *Mont. Fl. Chil. Cell.* 11. *p.* 307. *t.* 16. *f.* 41. *Harv. in Fl. Nov. Zel. v.* 2. *p.* 225. *Fl. Tasm. v.* 2. *p.* 299.

HAB. Sealer's Cove, Gipps' Land, *Dr. F. Mueller.* Tasmania, *C. Stuart.*

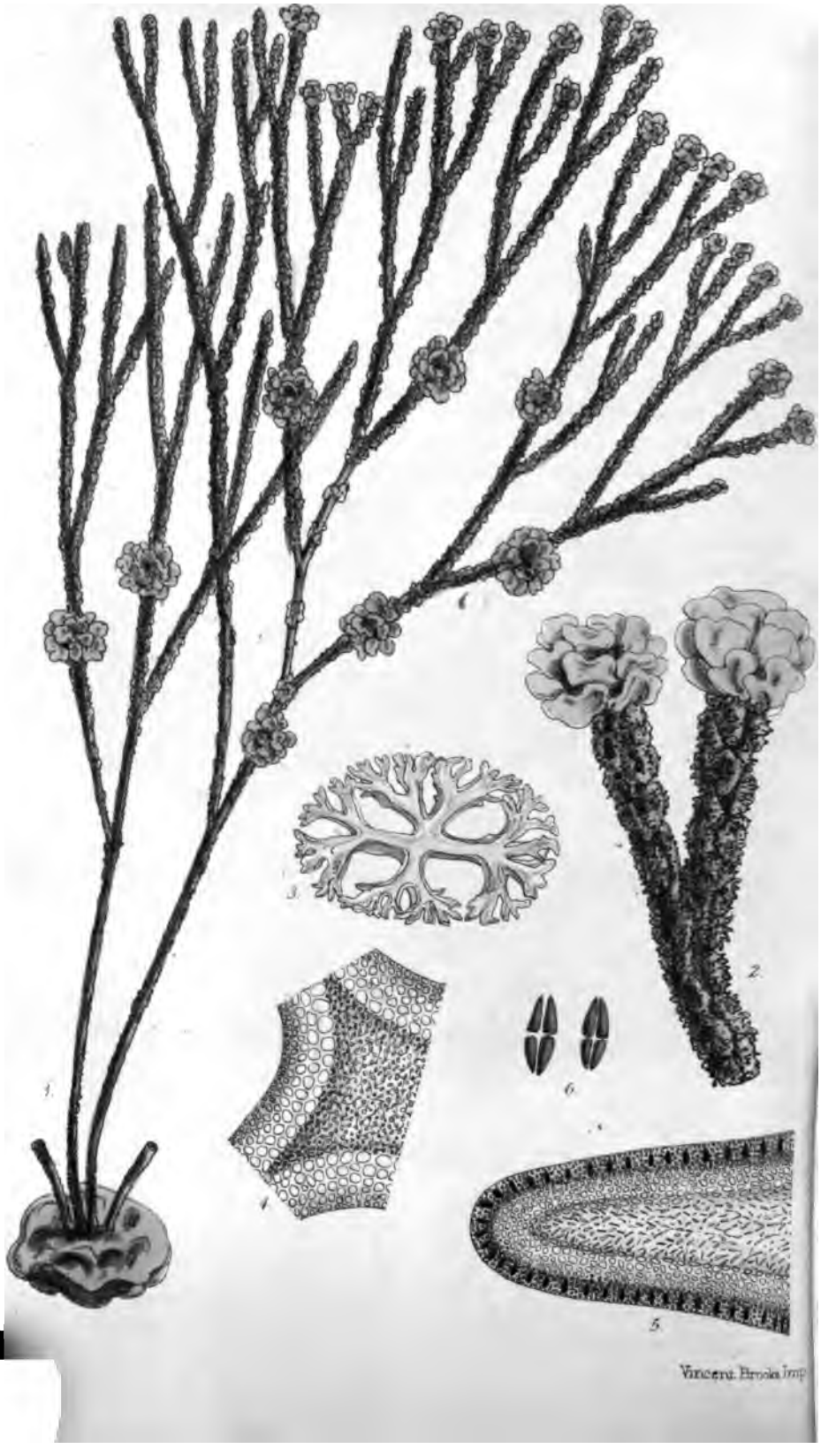
GEOGR. DISTR. Coast of Chili. New Zealand.

DESCR. *Fronds* densely tufted, spreading in patches over sticks and straws, etc. accidentally submerged, 1–3 inches high, somewhat thicker than human hair, bi-tri-pinnated. The principal stem and branches are angularly flexuous or zigzag; all are dotted with minute surface-cellules, and a cross-section shows them to be composed of several rows of hexagonal cells, each containing a bag of dark-purple endochrome. *Pinnæ* alternate, variable in length, long and short intermixed, patent, once or twice compounded. The *pinnules* also vary in degree of composition; the lowest are often quite simple, those next in order bifid or trifid, and the uppermost frequently multifid or

dichotomous. The apices are strongly inrolled. No *fructification* has yet been observed on Australian specimens. The *colour* is a deep purple, becoming paler on exposure. The *substance* is cartilaginous, not very soft. In drying, the frond adheres, but not closely, to paper.

This species belongs to a different section of the genus from that to which the two species already illustrated (Plate CLXXVI.) belong. In *B. Harveyi* the axile cells are in *several* rows surrounding a central cell; in *B. mixta* and *rivularis* they are in a single row. By this character, therefore, as well as the minute size of the surface-cellules, our plant is readily known from its Australian congeners; but it comes very near the European *B. scorpioides*, from which its smaller size and more slender branches and ramuli chiefly distinguish it.

Fig. 1. BOSTRYCHIA HARVEYI,—*the natural size.* 2. Part of a branch. 3. A ramulus. 4. Transverse section of stem :—*magnified.*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Vincent Brooks Imp

PLATE CCXCIII.

THAMNOCLONIUM HIRSUTUM, *Kütz.*

GEN. CHAR. *Frond* dendroid or flabelliform, compressed or plane, imperfectly costate, rigidly horny or coriaceous, mostly covered with spinous tubercles, composed of two strata; the *medullary* stratum very dense, of slender, cylindrical, longitudinally seriated cellules; *cortical* of roundish-angular, coloured cells. *Fructification:* 1, *cystocarps?*; 2, cruciate *tetraspores*, contained in *sporophylla*.—THAMNOCLONIUM (*Kütz.*), from *θαμνος, a shrub*, and *κλων, a branch.*

Frons dendroidea v. flabelliformis, compressa v. plana, immerse costata, rigide cornea et coriacea, sæpissime spinuloso-verrucosa, stratis duobus composita; strato medullari densissimo, cellulis cylindraceis gracilibus longitudinaliter seriatis; corticali cellulis rotundato-angulatis coloratis formato. Fruct.: 1, *cystocarpia ignota;* 2, *tetrasporæ cruciatim divisæ, in sporophyllis propriis evolutæ.*

THAMNOCLONIUM *hirsutum;* frond decompound-dichotomous, fastigiate; branches terete, or the smaller ones subcompressed, closely covered with muricated warts, obtuse; spore-leaves in rose-like tufts, lateral or terminal, containing beneath their surface cruciate tetraspores.

T. hirsutum; *fronde decomposito-dichotoma fastigiata, ramis teretibus v. minoribus vix subcompressis creberrime echinato-verrucosis obtusis; sporophyllis rosulatis lateralibus v. terminalibus in strato corticali tetrasporas cruciatas foventibus.*

THAMNOCLONIUM hirsutum, *Kütz. Phyc. Gen. p.* 392; *Sp. Alg. p.* 793. *Harv. in Hook. Fl. Tasm. v.* 2. *p.* 295.

POLYPHACUM dichotomum, *J. Ag. Linn. v.* 15. *p.* 3.

FUCUS hirsutus, *Herb. Berol.*

HAB. South coast of New Holland. Tasmania.

GEOGR. DISTR. Said to be found also at Port Natal, *Kütz.*

DESCR. *Root* a broad rigid disc, an inch or more in diameter. *Fronds* several from the same disc, 6–10 inches high, simple (or stipitate) for 2–3 inches above the base, then forking, and afterwards many times forked or alternately branched. The *branches* are nearly level-tipped, erect, or erecto-patent, with acute axils; the larger ones are quite terete, the upper slightly wider and somewhat compressed. All parts, save the denuded stems and bases of old branches, are closely covered with oval or oblong multifid-foliated or echinate warts, peltate in insertion, fixed to the branch by a slender neck. A section of a young branch (Fig. 3) shows four of these, surrounding a scarcely developed axis. In old sections the axial portion is more enlarged

and rounder. *Cystocarps* are unknown. *Tetraspores* are borne in the p pheric cells of little roundish wavy spore-leaves, which occur in tufts (small double roses), either at the ends of the branches, or bursting irregul from any part of the side. The cellular structure of the frond is very de composed of minute cellules. The *colour* is a dark dull brown-red, turn still darker in drying, and a horny brownish-white on exposure to weather. The *substance* is extremely rigid and tough, harsh to the tou In drying, the frond does not adhere to paper.

This is the original species on which Kützing founded l genus *Thamnoclonium*. It had previously been placed, by Agardh, in the genus *Polyphacum*, one of the *Rhodomelace* to which it bears a very close external resemblance, but fr which it differs essentially in structure, and, so far as the fruc fication is known, in that respect also. None of the *Rhodom laceæ* have distinctly cruciate tetraspores, scattered through t peripheric stratum of leaflets, as we find them in *Thamnocloniu* so, whatever fate may await this genus on the discovery of *cystocarp*, it is not likely that it will ever be again referred *Rhodomelaceæ*.

This plant is not unfrequent on the shores of Victoria a Tasmania, being cast ashore from deep water. When fi thrown up it is very dark-coloured, but as commonly seen the shore is either much paler or nearly colourless.

Fig. 1. THAMNOCLONIUM HIRSUTUM,—*the natural size*, 2. Apex of a bra with two terminal spore-leaf clusters. 3. Section through a ramulus. Cellular tissue of the same. 5. Section through a spore-leaf. 6. Te spores from the same:—variously *magnified*.

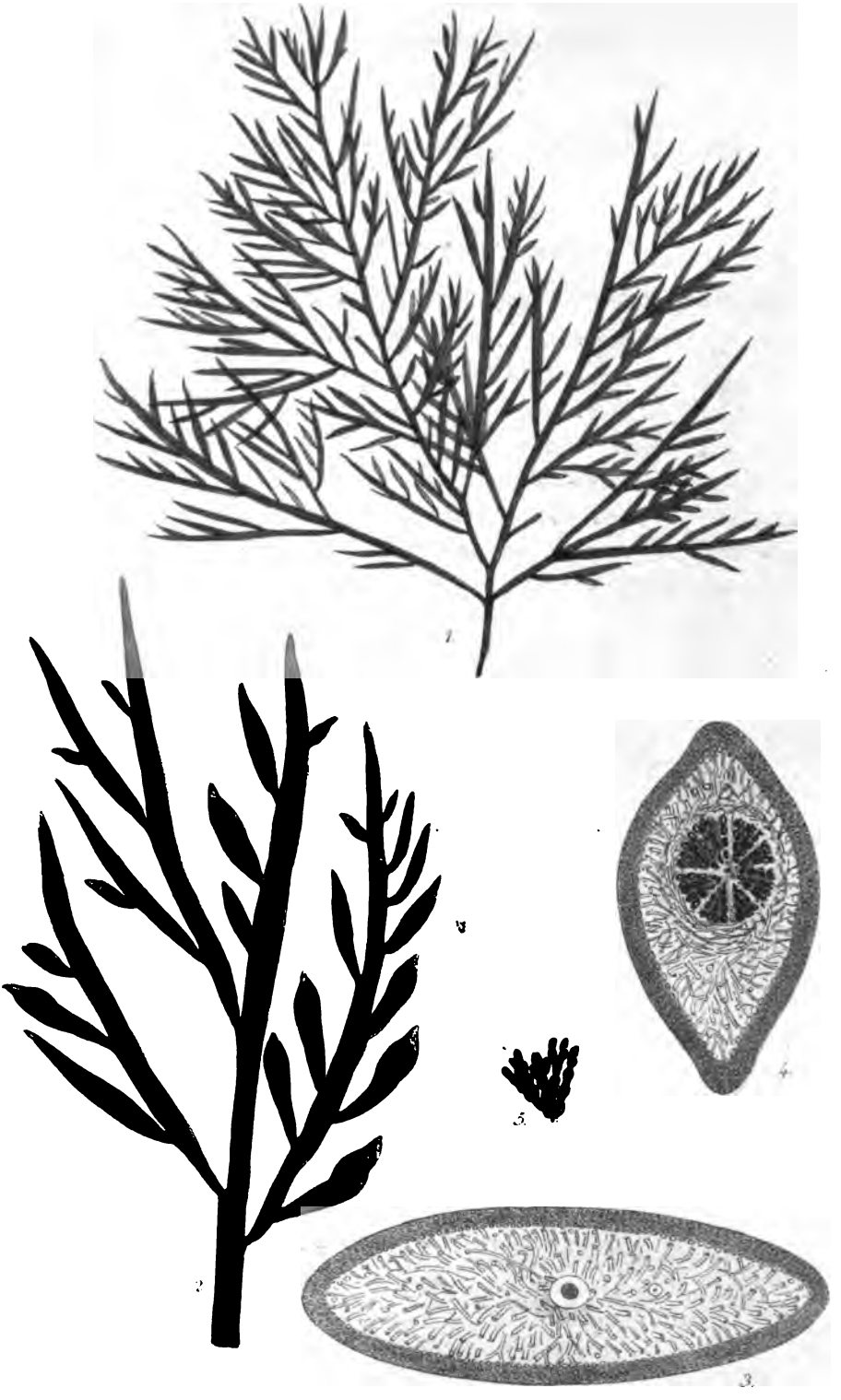

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PLATE CCXCIV.

ARESCHOUGIA STUARTII, *Harv.*

GEN. CHAR. *Frond* compressed or filiform, vaguely branched, composed of an articulated axial filament, and three (rarely but two) strata of cells; the *medullary* stratum consisting of longitudinal, anastomosing, interwoven filaments; the *intermediate* (sometimes absent) of several rows of roundish, coloured cells; the *cortical* of minute, vertically seriated cellules. *Fructification:* 1, *conceptacles* immersed in the frond, suspended among the filaments of the medullary stratum, and enclosed in a network of filaments, opening by an external pore, and containing moniliform strings of spores, radiating from a central placenta; spores roundish; 2, zonate *tetraspores*, formed on the cortical stratum of the ramuli.—ARESCHOUGIA (*Harv.*), in honour of Dr. J. E. Areschoug, Professor of Botany at Upsal, a distinguished algologist.

Frons compressa v. filiformis, vage ramosa, immerse costata, e filo centrali articulato et stratis fere tribus cellularum constituta. Stratum medullare e filis articulatis longitudinalibus anastomosantibus intertextis, intermedium (nunc deficiens) e cellulis rotundatis majusculis pluriseriatis, corticale e cellulis minimis verticalibus formatum. Fruct.: 1, *cystocarpia fronde immersa, inter fila strati medullaris suspensa, reticulo filorum velata, carpostomio demum aperta, fila sporifera moniliformia a placenta centrali emissa continentia; sporæ subrotundæ;* 2, *tetrasporæ zonatim divisæ, inter cellulas corticales ramulorum nidulantes.*

ARESCHOUGIA *Stuartii;* frond flattened, two-edged, closely branched, decompound-pinnate; pinnæ tapering to base and apex; pinnules nearly lanceolate, acute at each end, erecto-patent, bearing immersed cystocarps.

A. Stuartii; *fronde plano-compressa ancipite crebre ramosa decomposito-pinnata, pinnis basi et apice angustatis, pinnulis fere lanceolatis utrinque acutis erecto-patentibus cystocarpia immersa gerentibus.*

ARESCHOUGIA Stuartii, *Harv. in Fl. Tasm. v.* 2. *p.* 321.

HAB. Southport, Tasmania, *C. Stuart.* Warnambool, *H. Watts.*

GEOGR. DISTR. South coast of Australia. Tasmania.

DESCR. *Root* a small disc. *Frond* 4–5 inches high, and as much in the spread of the branches, distichously much branched, strongly compressed or flattened, two-edged, about ½–¾ of a line in breadth. The branching is irregularly decompound-pinnate, sometimes with close sometimes with remote

branches, and long and short branches are intermixed without order. *Branches* and *branchlets* alternate or scattered, linear-lanceolate, much constricted at their insertion and tapering to an acute point, the larger ones with an obscure midrib. The cellular structure of the *intermediate* layer of the frond is much laxer than in other species of the genus. *Cystocarps* are immersed in the smaller ramelli, below the apex, and are either solitary or in pairs; they consist of strings of spores radiating from a centre. *Tetraspores* have not been observed. The *colour* is a very deep blood-colour, becoming rather brighter if kept in fresh water, but turning dark if dried without previous steeping. *Substance* cartilaginous and rigid. In drying, the frond does not adhere to paper.

This pretty species of *Areschougia* is allied, on the one hand, to *A. australis*, from which its small size, as well as internal structure, separate it, and on the other to *A. Laurencia*, from which it differs by its strongly compressed almost flattened branches and ramuli. Its discovery is due to Mr. C. Stuart, who gathered it, with many other interesting Algæ, at Southport, Tasmania, where, judging from the number of specimens sent, it would seem to be not uncommon. Mr. Stuart's meritorious explorations of Australian botany, both marine and terrestrial, worthily entitle him to the compliment gratefully bestowed on him in the specific name.

Fig. 1. ARESCHOUGIA STUARTII,—*the natural size.* 2. Portion of the frond, in fruit. 3. Cross-section of a branch. 4. Cross-section through an immersed cystocarp. 5. Strings of spores:—variously *magnified.*

Plate CCXCV

Vincent Brooks, Ir

PLATE CCXCV.

RHODYMENIA CUNEATA, *Harv.*

GEN. CHAR. *Frond* flat, membranous, dichotomous or palmate, composed of two strata of cells; the *medullary* stratum of oblong, polygonal, larger cells; the *cortical* of minute, vertically seriated cellules. *Fructification:* 1, sessile, hemispherical, thick-walled *conceptacles,* at length opening by a terminal pore, containing densely-packed sporiferous filaments issuing from a basal placenta, and surrounded by a gelatinous pellicle; 2, cruciate or tripartite *tetraspores,* either scattered over the frond, collected in *sori,* or immersed in terminal, shield-like *nemathecia.*—RHODYMENIA (*Grev.*), from ῥοδεος, *red,* and ὑμην, *a membrane.*

Frons plana, membranacea, dichotoma v. palmata, stratis duobus composita; strato medullari ex cellulis majusculis oblongis polyhedris, corticali cellulis minimis coloratis pluriserialibus conflata. Fruct.: 1, *cystocarpia sessilia, hemisphærica, intra pericarpium crassum demum carpostomio apertum fila sporifera densissime aggregata, e placenta basali emissa, pelliculâ gelatinoso-cellulosâ velata foventia;* 2, *tetrasporæ cruciatim v. triangule divisæ, nunc sparsæ, nunc in soros subdefinitos collectæ v. in nematheciis terminalibus immersæ.*

RHODYMENIA *cuneata;* stipes short, soon expanding into the base of the frond; frond broadly cuneate, subpalmatifid, pale-red, membranous; the margin entire and flat; cystocarps very numerous, scattered over the whole surface of the frond.

R. cuneata; *stipite brevi mox in basi frondis desinente, fronde lato-cuneata subpalmatifida, dilute rubra membranacea, margine simplici, cystocarpiis numerosissimis per totam frondem sparsis.*

RHODYMENIA cuneata, *Harv. in Fl. Tasm. v.* 2. *p.* 319.

HAB. East coast of Tasmania, *R. Gunn.*

GEOGR. DISTR. Tasmania.

DESCR. *Root* a small disc. *Stipes* slender, scarcely thicker than hog's-bristle, terete, ¼–½ inch long, passing into the cuneate base of the frond. *Frond* 4–6 inches long, and as much in expansion, broadly cuneate, irregularly cleft or semi-cleft into two or more principal segments, which are again often bifid or lacerate, each segment from 1–2 inches wide, oblong or cuneate, the apices emarginate or shortly bifid and subacute. The margin is quite entire and flat, or slightly undulating. *Cystocarps* (on *fertile fronds*) extremely numerous, scattered over the whole surface, very prominent to

one surface, slightly constricted at base and depressed at apex, having a very thick densely cellular wall, and containing a nucleus which does not nearly fill the cavity. *Colour* a pale red, fading to yellowish or dirty-white. *Substance* thin, membranous and soft. In drying, the frond adheres closely to paper.

This appears to be a well-marked species, not likely to be confounded with any other, although in general outline it resembles some states of *R. palmata*. The capsule-bearing frond, from its profusely abundant and very prominent cystocarps, bears much resemblance to *Gracilaria polycarpa*, but it is an external resemblance merely. Again, there is some similarity between the cystocarps of our plant and those of an *Epymenia*, especially in the very thick walls of the pericarp and the ample cavity. But here again the relation ends, and on the whole, so far as we know, our plant is best placed in *Rhodymenia*.

I am not aware on what part of the east coast of Tasmania Mr. Gunn collected the few specimens which are all that I have yet seen of this species.

Fig. 1. RHODYMENIA CUNEATA. 2. Small portion of a fertile frond:—both of the *natural size*. 3. Section of frond and cystocarp,—*magnified*.

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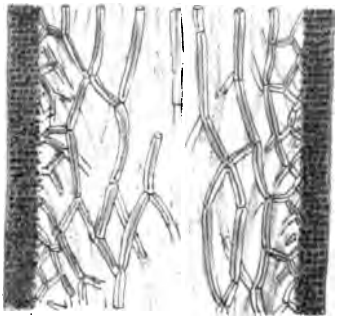

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Vincent Brooks Im

PLATE CCXCVI.

CATENELLA OPUNTIA, *Grev.*

GEN. CHAR. *Frond* dull-purple, constricted at intervals as if jointed, branched, subtubular, formed by longitudinal interlacing and anastomosing filaments, emitting toward the surface moniliform filaments, whose apices cohere into the membranous wall of the frond. *Fructification:* 1, *cystocarps* formed in minute, ovate or roundish ramuli; 2, *tetraspores* zonately divided, scattered through the peripheric cells. —CATENELLA (*Grev.*), from *catena*, a chain.

Frons purpurea, moniliformiter constricta, articulato-ramosa, subtubulosa, contexta filis longitudinalibus anastomosantibus, superficiem versus in fila moniliformia abeuntibus et in stratum periphericum muco cohibitum coalescentibus. Cystocarpia in ramulis minutis ovatis subglobosisve immersa. Tetrasporæ inter fila peripherica sparsæ, zonatim divisæ. J. Ag.

CATENELLA *Opuntia;* frond creeping, with procumbent shoots, densely tufted, irregularly dichotomous; joint-like internodes compressed, obovate or oblong or cylindrical, 3–5 times as long as broad; apices acute.

C. Opuntia; *fronde surculis procumbentibus reptante dense cæspitosa subdichotoma v. irregulariter ramosa, articulis compressis obovatis v. oblongis nunc cylindraceis diametro* 3–5-*plo longioribus, apicibus acutis.*

CATENELLA Opuntia, *Grev. Alg. Brit. p.* 166. *t.* 17. *Harv. Phyc. Brit. t.* 88. *J. Ag. Sp. Alg. v.* 2. *p.* 352. *Kütz. Syst. p.* 724, *etc.*

FUCUS Opuntia, *Good. and Woodw. Stack. Ner. Brit. t.* 16. *Turn. Hist. t.* 107.

HALYMENIA? Opuntia, *Ag. Syst. p.* 245.

RIVULARIA Opuntia, *E. Bot. t.* 1868.

HAB. Crevices of rocks near high-water mark. Shores of Elizabeth Bay, Port Jackson, *W. H. H.* Paramatta, *W. Woolls.*

GEOGR. DISTR. Atlantic and Mediterranean coasts of Europe. New Zealand.

DESCR. *Fronds* springing from a mat of irregularly branched, creeping root-stems, erect, densely tufted, and forming patches two or more inches across, half an inch to nearly an inch high, sparingly and irregularly branched, constricted at short intervals as if jointed, and thus forming branched strings of oblong or obovate internodes. The branching is generally more or less dichotomous, and there is frequently in the Australian specimens a tendency to emit disc-like roots from the upper and middle nodes, especially just below the start-point of a new branch. The internodes are strongly compressed when dry or half-dry, but are occasionally distended, and then

nearly terete; they vary much in form and comparative length and breadth; the terminal one is almost always acute. The *cystocarps* are very rarely produced, and their structure not well ascertained; by Agardh the nucleus is described as consisting of obovate spores radiating from a centre and forming a globose mass, suspended among the central network of filaments in minute branchlets. *Tetraspores* are more frequent, but we have not found them in the Australian plant; they are oblong, zonate, and lodged in the periphery of the frond. The *colour* is a very dark, dull purple, becoming almost black in drying. The *substance* is membranous and somewhat rigid, and the plant does not adhere to paper in drying.

The little Alga here figured is well known to European botanists, being common along the whole European seaboard, both Atlantic and Mediterranean; but in Australia, so far as we yet know, it is confined to Port Jackson harbour. There, indeed, it is common enough in the two localities above given, and most probably exists in other parts of the harbour as yet unexplored. I find no appreciable difference between the European and the Australian plant, and specimens collected by Dr. Hooker in New Zealand are very similar.

Fig. 1. CATENELLA OPUNTIA,—*the natural size.* 2. A frond from the tuft. 3. Longitudinal section. 4. Transverse section:—*magnified.*

Vincent Brooks

PLATE CCXCVII.

GIGARTINA DISTICHA, *Sond.*

GEN. CHAR. *Frond* carnoso-cartilaginous, flat or cylindrical, simple or variously branched, composed of two strata of cells; the medullary stratum, of cylindrical, articulated filaments, anastomosing into a vrey lax network; the cortical, of moniliform, vertical, dichotomous filaments set in firm gelatine. *Fructification:* 1, external, globose, finally perforate *conceptacles,* containing within a saccate *placenta* (?) formed of closely interwoven filaments, a compound *nucleus* consisting of many confluent *nucleoli,* or masses of roundish-angular spores; 2, cruciate *tetraspores,* collected into dense, subprominent sori, lodged beneath the superficial cells.—GIGARTINA (*Lamour.*), from γιγαρτον, *a grape-stone,* which the conceptacles resemble.

Frons carnoso-cartilaginea, plana v. cylindracea, ramosa, ex stratis duobus cellularum composita; stratum medullare ex filis tenuibus cylindraceis laxe anastomosantibus, corticale ex filis moniliformibus verticalibus dichotomis formatum. Fruct.: 1, *favellidia intra pericarpium externum carpostomio pertusum excepta, filis arachnoideis intertextis obvoluta;* 2, *tetrasporæ cruciatim divisæ, in soros subprominentes infra stratum corticale nidulantes plurimæ collectæ.*

GIGARTINA *disticha;* frond strongly compressed, thick, linear, pinnately decompound, pinnæ distichous, often few and irregular, pinnules cylindrical, obtuse, simple or forked, spreading; cystocarps solitary in the tips of the pinnules; sori elongate, immersed in the pinnules.

G. disticha; *fronde compresso-plana crassa lineari pinnatim decomposita, pinnis distichis conformibus sæpius paucis et vagis, pinnulis cylindraceis obtusis simplicibus et furcatis patentibus, cystocarpiis in apicibus pinnularum, soris elongatis infra apices immersis.*

GIGARTINA disticha, *Sond. Bot. Zeit.* 1845, *p.* 55. *Sond. in Pl. Preiss. v.* 2. *p.* 175. *J. Ag. Sp. Alg. v.* 2. *p.* 269. *Harv. Alg. Exsicc. Austr. n.* 400.

HAB. Swan River, *Preiss! Milne! W. H. H.*

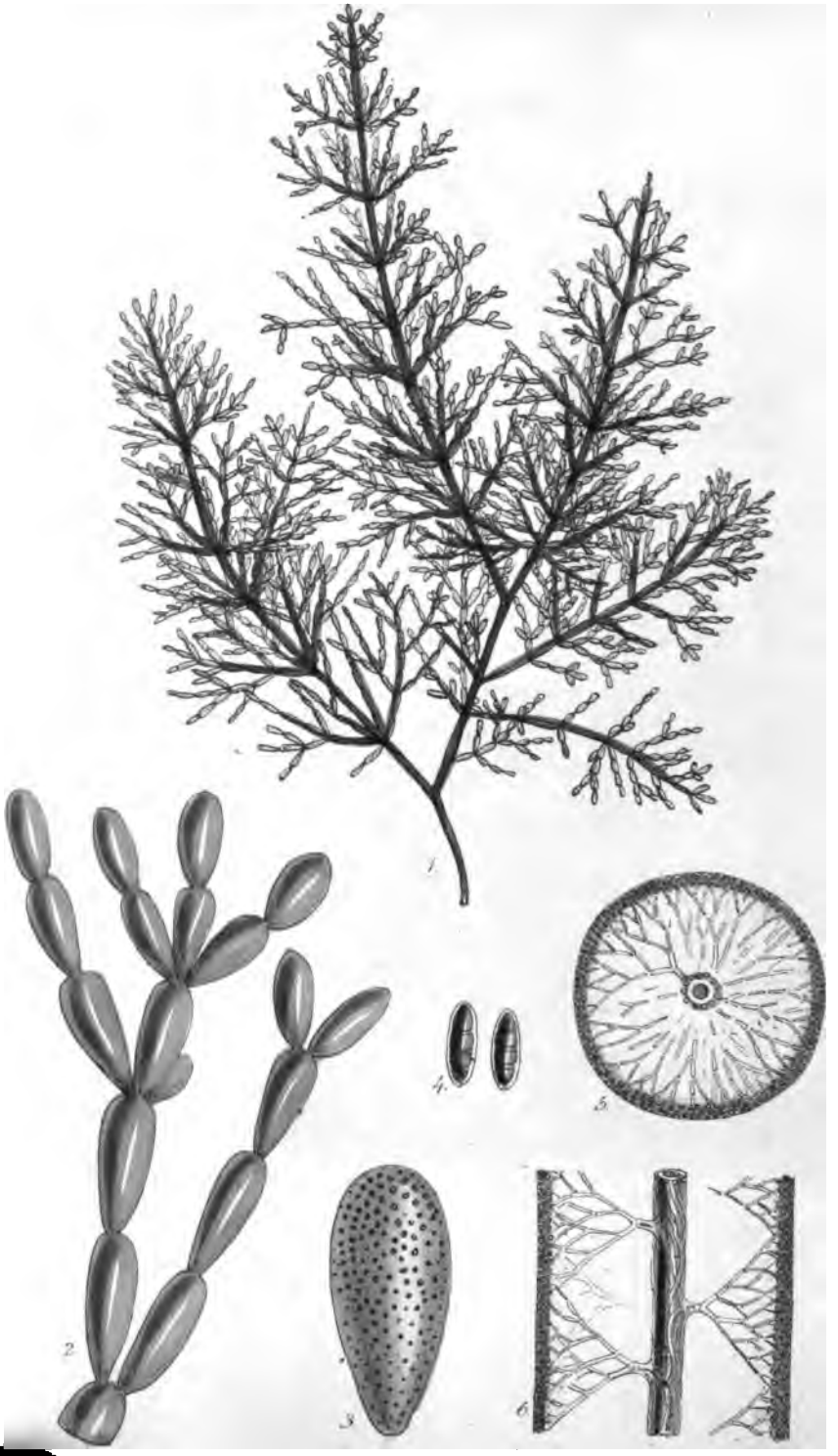
GEOGR. DISTR. Western Australia.

DESCR. *Root* an expanded, fleshy disc, an inch or more in diameter. *Fronds* many from the same base, 8–12 inches long, distichously much divided in a more or less pinnate manner; the main stem either quite simple or dividing into two or more principal branches, more or less strongly compressed, as are also the primary and secondary branches. *Pinnæ* sometimes few and irregular, sometimes numerous and rather closely set, either alternate or subopposite, widely and often horizontally spreading, pinnulated for their whole length, or in the upper part only, 2–3 lines wide, compressed or subterete.

Pinnules 3–6 lines long, cylindrical, obtuse, not a line in diameter, either simple or more frequently forked, the arms long or short, sometimes twice or thrice forked, scattered or crowded, always widely spreading, and often horizontal. *Cystocarps* (which I have not seen) solitary, immersed in the ends of the forks of the pinnules. *Tetraspores* forming long sori, immersed in the substance of the ramuli, very numerous and densely packed, dark purple, cruciately parted. *Colour* a dark, lurid and dull purple, changing on exposure to pale horn-colour or greenish-yellow. *Substance* cartilaginous and firm, horny and rigid when dry, in which state the frond does not in the least adhere to paper.

The young and the full-grown specimens of this plant are remarkably different, as may be seen in fig. 1 of our Plate; the young plant being either quite simple, or once or twice forked, and destitute of lateral ramuli; the full-grown, on the contrary, copiously pinnate or bipinnate. Though there is a peculiarity of habit among all the specimens I have seen, yet some of them approach suspiciously near to some forms of *G. pinnata*, J. Ag. (itself a variable plant), and it is possible that a fuller suite of specimens might connect the two; or even that both should be regarded as varieties of the older *G. livida*. Small differences in ramification are scarcely sufficient to separate plants otherwise so strongly related. Our figure, however, represents what may be called the typical form of *G. disticha*, Sond.

Fig. 1. GIGARTINA DISTICHA,—*the natural size.* 2. Cross section, to show the structure of the frond, and an immersed *sorus* of tetraspores. 3. Tetraspores:—*both magnified.*



Vincent Brooks, Imp

PLATE CCXCVIII.

ERYTHROCLONIUM MUELLERI, *Sond.*

GEN. CHAR. *Stem* terete, its branches constricted as if jointed, composed of an articulated axial filament, and three strata; the medullary stratum composed of longitudinal, interwoven filaments; the *intermediate* of several rows of roundish, coloured cellules; the *cortical* of very minute, subseriated cellules. *Fructification:* 1, *conceptacles* sessile, depressed, umbilicate, opening by a terminal pore, containing, within a thick pericarp, moniliform strings of spores, radiating from a free central placenta; 2, zonate *tetraspores*, dispersed through the cortical cells.—ERYTHROCLONIUM (*Sond.*), from *ερυθρος*, *red*, and *κλων*, *a branch.*

Frons caule tereti, ramisque articulato-constrictis, ex filo centrali articulato et stratis tribus cellularum constituta; strato medullari filis tenuibus longitudinalibus intertextis, intermedio cellulis rotundato-angulatis pluriseriatis, corticali cellulis minimis subseriatis formato. Fruct.: 1, *cystocarpia sessilia, depressa umbilicata, carpostomio demum aperta, intra pericarpium crassum fila sporifera moniliformia ex placenta centrali radiantia, foventia:* 2, *tetrasporæ sparsæ, zonatim divisæ.*

ERYTHROCLONIUM *Muelleri;* stem thick, cylindrical, branched; branches opposite or whorled, constricted, the internodes fusiform; ramuli moniliform, their internodes oval or oblong, acute at base.

E. Muelleri; *caule crasso tereti glabro elongato ramoso, ramis oppositis verticillatisque articulato-constrictis articulis fusiformibus, ramulis moniliformibus eorum articulis ovalibus oblongisve basi acutis.*

ERYTHROCLONIUM Muelleri, *Sond. in Linn. v.* 25. *p.* 692.

HAB. Lefebre Peninsula, *Dr. Mueller,* July, 1852.

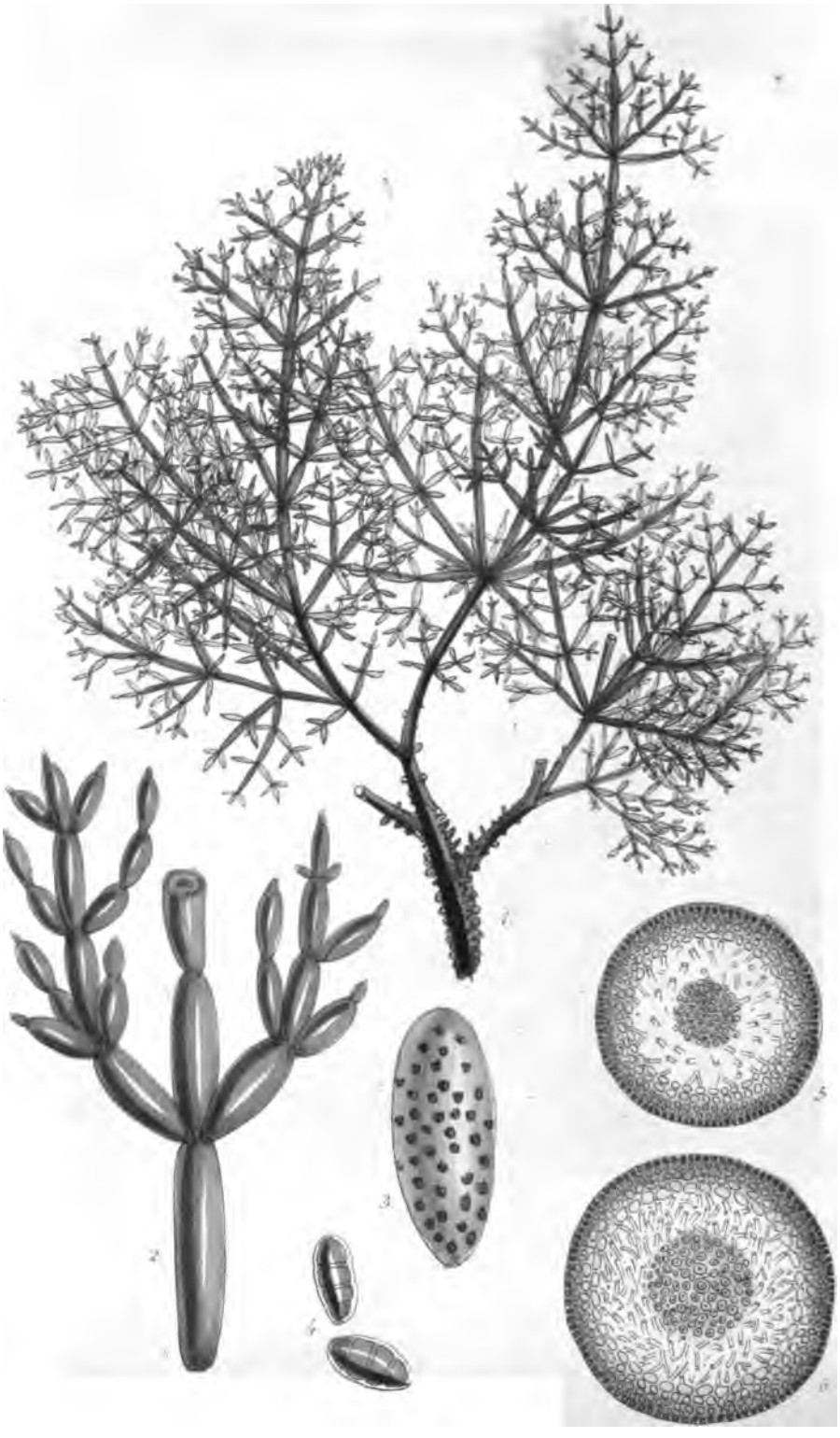
GEOGR. DISTR. South coast of Australia.

DESCR. *Root* unknown. Frond 6 inches long or more, very much branched in a trichotomous or whorled manner. *Primary* stem cylindrical, as thick as whipcord, imperfectly nodose, either simple or branched, emitting to all sides branches, which are more evidently contracted at the nodes into a series of joint-like internodes. *Branches* opposite, alternate or whorled, widely spreading, their internodes several times longer than broad, fusiform, or tapering at base, closely beset with ramuli. *Ramuli* moniliform, of few or several bead-like joints, whorled or opposite, horizontally spreading, simple or trifid, their joints oval or oblong, the terminal ones obtuse. *Cystocarps* not known. *Tetraspores* very numerous, minute, zonate, lodged in the joints of the ramuli. *Colour* a deep vinous-red, darkening in the herbarium.

Structure, in the younger parts, a central, jointed filament, coated with slender, interlaced, longitudinal fibres, which emit, to the periphery, dichotomous, alternate branches, whose apices, united, form the membranous wall (or periphery) of the frond; in older parts this latter is much thickened. *Substance* membranous and succulent, filled with juice when recent. In drying, the younger parts of the frond adhere to paper.

This is apparently a rare plant, which I only know through a specimen given me by Dr. Mueller. It is externally so extremely like our *Rhabdonia verticillata*, figured in the following Plate, that I may be pardoned for having formerly confounded them. Indeed, I can even now scarcely distinguish them but by an appeal to the microscope, when the very dissimilar cellular structure shows that they cannot be the same, or even placed (according to our present views of systematic arrangement) in the same genus. The *tetraspores* in our present plant, though similarly placed to those in *Rhabdonia*, and of similar structure, are of much smaller size. The *cystocarps* of neither plant are known. It was on the present species that Sonder founded his genus *Erythroclonium*.

Fig. 1. ERYTHROCLONIUM MUELLERI,—*the natural size*. 2. Branchlets. 3. One of the internodes, with *tetraspores*. 4. Tetraspores. 5. Cross section of the frond. 6. Longitudinal section:—*magnified*.



Vincent Brooks Imp.

PLATE CCXCIX.

RHABDONIA VERTICILLATA, *Harv.*

GEN. CHAR. *Frond* filiform, decompound, imperfectly tubular; tube partly filled with longitudinal, branching and anastomosing filaments; peripheric stratum composed of polygonal cellules, smaller toward the circumference. *Fructification:* 1, *conceptacles* immersed in the branches, suspended among the axial filaments and enclosed in a network of filaments, containing moniliform strings of spores, radiating from a central placenta; 2, zonate *tetraspores* dispersed through the superficial stratum.—RHABDONIA (*Harv.*), from ῥαβδος, *a twig;* in allusion to the twiggy ramification of the species.

Frons filiformis, decomposite ramosa, tubulosa; tubo filis longitudinalibus ramosis anastomosantibus percurso; strato peripherico ex cellulis angulatis superficiem versus minoribus contexto. Fruct.: 1, *cystocarpia infra stratum periphericum suspensa, reticulo filorum velata, carpostomio demum aperta, fila sporifera moniliformia a placenta centrali emissa continentia;* 2, *tetrasporæ zonatim divisæ, per ramos minores sparsæ, immersæ.*

RHABDONIA *verticillata;* stem short and thick, solid, beset with wart-like abortive ramuli, and emitting numerous decompound branches; branches constricted at intervals into pseudo-joints, and whorled at the nodes with similarly constricted lesser branches and ramuli; internodes of the branches linear-oblong, many times longer than broad, of the ramuli oval or shortly oblong, the terminal acute; tetraspores immersed in the ramuli.

R. verticillata; *caule brevi incrassato solido dense verrucoso ramos numerosos decompositos emittente, ramis articulato-constrictis ad nodos ramis minoribus conformibus verticillatis, internodiis ramorum lineari-oblongis diametro pluries longioribus, ramulorum ovalibus v. breve oblongis, terminalibus acutis, tetrasporis in ramulis immersis.*

RHABDONIA verticillata, *Harv. in Herb. T. C. D.* (1852.)

ERYTHROCLONIUM Muelleri, *Harv. Alg. Exsic. Austr. n.* 390; *Fl. Tasm. v.* 2. *p.* 322. (*excl. syn.*)

HAB. South Australia, *Dr. Curdie!* Port Philip, plentifully, *W. H. H., Dr. Mueller!* Western Port, *Dr. Mueller!* Georgetown, Tasmania, *W. H. H.*

GEOGR. DISTR. South coast of Australia. Tasmania.

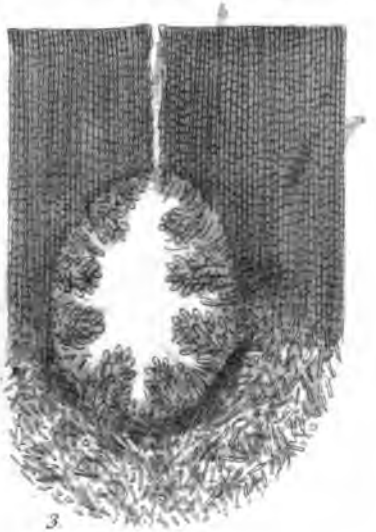
DESCR. *Root* a large, knobby, thick disc. *Fronds* one or more from the same base, 3–12 inches long, very much branched, and bushy. *Main stem* thick, solid, hard, once or twice forked, or irregularly divided, almost always

densely covered, at least in the lower part, with wart-like papillæ, which occasionally lengthen into ramuli. *Branches* (or secondary fronds) spring irregularly from the sides and ends of the divisions of the primary stem, and spread in all directions; they are excessively divided, in a trichotomous or polychotomous manner, the minor divisions being repeatedly whorled, all parts being constricted at regular intervals into spurious joints. These joints, in the lower part, are often half an inch long, or more, and about a line in diameter; in the upper part gradually shorter, and the terminal ones are not a line in length. All the ramuli are moniliform, with oblong or oval internodes. *Cystocarps* have not been observed. Zonate *tetraspores* occur commonly in the internodes of the ramuli, dotting over the surface, and vertically immersed in the peripheric cells. The *colour* is a deep, full red, becoming darker and brownish in drying. The cross section of a young branch shows a thick, peripheric stratum, formed of many rows of small cells, a very laxly fibrous intermediate stratum, and a dense medullary bundle of filaments, none of which is remarkably larger than the rest; a section of an old branch has essentially the same structure, but the longitudinal fibres are much more numerous and densely crowded, so that the frond becomes nearly solid. *Substance* soft and juicy, but not gelatinous. In drying, the frond adheres closely to paper.

I have already said, under Plate CCXCVIII., that I formerly confounded the present plant with the much rarer *Erythroclonium Muelleri*. Besides the difference in cellular structure, illustrated in the Plates, the *Rhabdonia* is generally distinguishable by its thick, warted stem, rather brighter colour, more juicy nature, and denser, more ramulous branching. It is also much more common, and extends over a wide district of coast. The first specimens I received were collected by Dr. Curdie at the mouth of the Glenelg; they are comparatively dwarf, compared with the magnificent ones which may be collected in the mouth of the Tamar, Tasmania, and which are large enough to cover a folio page; but I find no structural difference between the larger and smaller. In *habit* there is a striking resemblance to the *Chylocladia articulata* of Europe, but structure and fruit are different.

Fig. 1. RHABDONIA VERTICILLATA,—*the natural size.* 2. Branchlets. 3. One of the internodes, with *tetraspores.* 4. Tetraspores. 5. Cross section of a younger branch. 6. Cross section of an older branch:—*magnified.*

Plate CCC



3.

2.

Vincent Brooks, Imp.

PLATE CCC.

D'URVILLÆA POTATORUM, *Aresch.*

GEN. CHAR. *Frond* stipitate, without distinct organs, flat and expanded, palmately or pinnately divided, coriaceous. *Spore-cavities* scattered over the whole frond, hollowed out in the cortical stratum below the surface, spherical, communicating with the surface through a pore, diœcious. *Spores* obovoid, subsessile. *Antheridia* on branched, parietal filaments, obovoid. *Paranemata* subsimple.

Frons stipitata, organis nullis discretis, expanso-plana, palmatim v. pinnatim divisa, coriacea. Scaphidia per totam frondem sparsa, in strato corticali infra superficiem excavata, sphærica, cum ostiolo superficiali per canalem communicantia, dioica. Sporæ obovoideæ, subsessiles. Antheria in filis ramosis parietalibus obovoidea. Paranemata subsimplicia.

D'URVILLÆA *potatorum;* root scutate; stipes short, compressed, expanding into a very long, strap-shaped, simple or forked, pinnated lamina; pinnæ lanceolate, tapering to base and apex.

D. potatorum; *radice scutata, stipite brevi compresso in laminam longissimam ligulatam simplicem v. furcatam pinnatam solidam expanso; pinnis lanceolatis basi et apice attenuatis.*

D'URVILLEA potatorum, *Aresch. Alg. Exsic.*

SARCOPHYCUS potatorum, *Kütz. Phyc. p.* 392; *Sp. Alg. p.* 587. *J. Ag. Sp. Alg. v.* 1. *p.* 190. *Hook. Fl. Tasm. v.* 2. *p.* 286.

LAMINARIA potatorum, *Lamour. Ag. Sp. p.* 115; *Syst. p.* 270.

FUCUS potatorum, *Labill. Nov. Holl. p.* 112. *t.* 257. *Turn. Hist. t.* 242.

HAB. From Cape Northumberland to Cape Howe. Western and Northern coasts of Tasmania.

GEOGR. DISTR. South coasts of New Holland. Tasmania.

DESCR. *Root* a thick, scutate disc, when fully grown 4–6 inches in diameter, and nearly an inch thick. *Stipes* subterete at base, soon compressed, and widening and flattening upwards till lost in the base of the lamina, 6–12 inches long, or more. *Lamina*, when fully grown, 12–24 feet long, or more, and nearly ¼ inch thick, simple, or once or twice forked, the segments strap-shaped, of great length, 6–12 inches broad, and more or less copiously furnished with lateral lobes or pinnæ, which sometimes are again lobulate. In some cases the division is nearly dichotomous throughout. *Pinnæ* lanceolate, tapering to both ends, simple, or once or twice forked. *Margins* undulate. *Spore-cavities* scattered over the whole surface of the lamina, visible only by their superficial pores, diœcious. I have not seen the *female*

cavities. *Antheridia* (in the *males*) on tufted, branching, parietal filaments, bright yellow, obovoid. *Colour* a dark olive, black when dry. *Substance* leathery and very tough, giving out much mucous matter in fresh water. The *structure* is very dense, of closely interwoven, branching and anastomosing filaments.

It is impossible in a small plate to do justice to a plant which, when fully grown, is measured, not by *inches*, but by *fathoms*, and which, to be seen in its true character, must be observed on the sea-shore. One of the full-grown fronds, such as are cast ashore at Port Fairy, is more than a sufficient load for a man. The ramification varies with age. Our Plate represents a very young frond; an older one may be split into many ribbons, each of them bordered with pinnæ; or it might be undivided, and bordered with many-times forked and attenuated segments. Kützing's genus *Sarcophycus*, founded on this species, is hardly worth retaining as distinct from *D'Urvillæa*, differing, as it does, merely on an inconstant character of ramification, and on a minor character in cellular structure.

This Alga received the name *potatorum* from Labillardière, in consequence of his observing that the natives of Tasmania "used portions of its great leaves, folded into the form of a pouch, for the purpose of keeping fresh water" (*Turn. l. c.*)

Fig. 1. D'URVILLÆA POTATORUM, a *very young* plant, of the *natural size*. 2. Portion of the surface of a fertile frond,—slightly *magnified*. 3. Section through one of the male *scaphidia*, with tufts of *antheridia*,—more highly *magnified*.

SYNOPTIC CATALOGUE

OF

AUSTRALIAN AND TASMANIAN ALGÆ.

Series I. MELANOSPERMEÆ.

Family I. FUCACEÆ.

I. SARGASSUM, *Agardh.*

1. **Peronii,** *Ag.* (J. Ag. Sp. Alg. i. p. 284. Turn. Hist. t. 247.)
   HAB. Western Australia, *Peron.*
2. **decurrens,** *Ag.* (PLATE CXLV.)
   HAB. North Australia, *R. Br.*, *Miss Taylor.* Rottnest Island, Western Australia, *W. H. H.* (Torres Straits, *Hb. Aresch.*)
3. **Boryi,** *Ag.* (J. Ag. l. c. p. 285.)
   HAB. Western Australia.
4. **varians,** *Sond.* (J. Ag. l. c. p. 287.)
   HAB. Western Australia, Holdfast Bay, Guichen Bay, and Port Gawler, *Dr. Mueller.*
5. **Raoulii,** *Hook. f. and Harv.* (PLATE CX.)
   HAB. Tasmania. South coast of Victoria.
6. **linearifolium,** *Ag.* (J. Ag. l. c. p. 296. Turn. t. 111.)
   HAB. Shores of New Holland, *Menzies*, *Sieber.*
7. **fallax,** *Sond.* (J. Ag. l. c. p. 297.)
   HAB. Western Australia.
8. **isophyllum,** *Sond.* (J. Ag. l. c. p. 298.)
   HAB. Western Australia.
9. **vestitum,** *Ag.* (J. Ag. l. c. p. 298. Turn. t. 177.)
   HAB. Western Australia. Kent Islands, *R. Br.*
10. **lacerifolium,** *Ag.* (PLATE CCVIII.)
    HAB. New Holland, *R. Br.* King George's Sound, *W. H. H.* Holdfast and Guichen Bays, *Dr. Mueller.*
11. **tristichum,** *Sond.* (J. Ag. l. c. p. 300.)
    HAB. New Holland, *Frazer!*
12. **biforme,** *Sond.* (J. Ag. l. c. p. 301.)
    HAB. Western Australia, Lefebre Peninsula, *Dr. Mueller.*

13. **paradoxum,** *Harv.* (J. Ag. l. c. p. 302. Turn. t. 156.)
HAB. South coast of New Holland. Tasmania.

14. **ensifolium,** *Ag.* (J. Ag. l. c. p. 302.)
HAB. New Holland, *Herb. Agardh.*

15. **carpophyllum,** *J. Ag.* (J. Ag. l. c. p. 304.)
HAB. New Holland, *Herb. Paris.* St. Vincent's Gulf. (Ceylon. Hong-kong. Torres Straits.)

16. **flavicans,** *Ag.* (J. Ag. l. c. p. 304.)
HAB. Western Australia, *Mus. Paris.* (Red Sea, at Suez, *Zanardini!*)

17. **baccularia,** *Ag.* (J. Ag. l. c. p. 307.)
HAB. New Holland, *Mus. Paris.*

18. **filifolium,** *Ag.* (J. Ag. l. c. p. 311.)
HAB. Western Australia, *Mus. Paris.*

19. **podacanthum,** *Sond.* (J. Ag. l. c. p. 323.)
HAB. Western Australia, *Preiss.*

20. **semulum,** *Sond.* (Sond. in Linn. xxv. p. 672.)
HAB. Holdfast Bay, *Dr. Mueller.*

21. **stenophyllum,** *J. Ag.* (J. Ag. l. c. p. 335.)
HAB. New Holland, *Mus. Paris.*

22. **ligulatum,** *Ag.* (J. Ag. l. c. p. 335.)
HAB. Western Australia, *Mus. Paris.*

23. **lanceolatum,** *J. Ag.* (J. Ag. l. c. p. 335.)
HAB. Western Australia, *Mus. Paris.*

24. **berberifolium,** *J. Ag.* (J. Ag. l. c. p. 337.)
HAB. Western Australia, *Labillardière.*

25. **Desvauxii,** *Ag.* (J. Ag. l. c. p. 338.)
HAB. Western Australia, *Mus. Paris.*

26. **spinuligerum,** *Sond.* (J. Ag. l. c. p. 338.)
HAB. Western Australia, *Frazer, Preiss.* Sidney and Port Philip, *Herb. Aresch.* S. Vincent's Gulf and Lefebre Peninsula, *Dr. Mueller.*

27. **tasmanicum,** *Sond.* (Sond. in Linn. xxv. p. 673.)
HAB. Tasmania, *Dr. Mueller.*

28. **vulgare,** *Ag.* (J. Ag. l. c. p. 342. Turn. t. 46.)

29. **bacciferum,** *Ag.* (J. Ag. l. c. p. 344. Turn. t. 47.)
HAB. Floating in the sea, off the coast of Western Australia, *Preiss.* (Atlantic Ocean, lat. 22°–58°. Gulf of Mexico. Brazil. Mediterranean Sea, off the coast of Spain. Indian Ocean. Pacific. New Zealand.)

30? **subalatum,** *Sond.* (J. Ag. l. c. p. 347.)
HAB. Western Australia, *Preiss.*

31? **distichum,** *Sond.* (J. Ag. l. c. p. 348.)
HAB. Western Australia, *Preiss.*

II. **TURBINARIA,** *Lamouroux.*

32. **gracilis,** *Sond.* (PLATE CXXXI.)
HAB. Western Australia.

III. **SEIROCOCCUS,** *Greville.*

33. **axillaris,** *Grev.* (PLATE IV.)
HAB. South coast of New Holland. Tasmania.

IV. SCYTOTHALIA, *Greville.*

34. **dorycarpa,** *Grev.* (PLATE IX.)
HAB. Western Australia, from King George's Sound to Cape Riche.

35. **dorycarpa,** var. **xiphocarpa,** *Harv.* (*S. xiphocarpa,* J. Ag. l. c. p. 259.)
HAB. South-western Australia: growing in deeper water than the preceding.

V. PHYLLOSPORA, *Agardh.*

36. **comosa,** *Ag.* (PLATE CLIII.)
HAB. South and south-east coasts of Australia. Tasmania. (New Zealand.)

VI. SCABERIA, *Greville.*

37. **Agardhii,** *Grev.* (PLATE CLXIV.)
HAB. Western and south coasts of Australia. Tasmania. (New Zealand.)

VII. CYSTOPHORA, *J. Agardh.*

38. **polycystidea,** *Aresch.* (J. Ag. Sp. Alg. 1. p. 241.)
HAB. South shores of New Holland.

39. **subfarcinata,** *J. Ag.* (J. Ag. l. c. p. 241.)
HAB. Western Australia.

40. **Brownii,** *J. Ag.* (PLATE CLXIX.)
HAB. King George's Sound, *R. Br.* etc.

41. **dumosa,** *Grev.* (J. Ag. l. c. p. 241.)
HAB. New Holland.

42. **monilifera,** *J. Ag.* (PLATE CCXLV.)
HAB. South coasts of New Holland. Tasmania. (New Zealand.)

43. **retroflexa,** *J. Ag.* (J. Ag. l. c. p. 242.)
HAB. New Holland. Tasmania. (New Zealand.)

44. **retorta,** *J. Ag.* (J. Ag. l. c. p. 243.)
HAB. Western Australia.

45. **torulosa,** *J. Ag.* (PLATE CXXIII.)
HAB. South coasts of Australia. Tasmania. (New Zealand.)

46. **spartioides,** *J. Ag.* (PLATE LXXVI.)
HAB. South coast of Australia. Tasmania.

47. **pectinata,** *Grev. and Ag.* (J. Ag. l. c. p. 244.)
HAB. New Holland, *Hb. Greville.*

48. **Platylobium,** *Ag.* (*C. Lyallii,* Harv. in Fl. Nov. Zeal. t. 108.)
HAB. South coast of New Holland. Tasmania. (New Zealand, *Lyall!*)

49. **xiphocarpa,** *Harv.* (Fl. Tasm. t. 185.)
HAB. Port Arthur, Tasmania, *W. H. H.*

50. **Grevillei,** *J. Ag.* (PLATE CLXXXIII.)
HAB. Western Australia.

51. **Cephalornithos,** *J. Ag.* (PLATE CXVI.)
HAB. South coast of Australia.

52. **uvifera,** *J. Ag.* (PLATE CLXXV.)
HAB. Western and south coasts of New Holland. Tasmania.

53. **botryocystis,** *Sond.* (PLATE LVI.)
HAB. South coast of Australia.

54. **Sondari**, *J. Ag.* (Plate CCXLIII.)
Hab. Western and south coasts of New Holland.

55. **flaccida**, *J. Ag.* (J. Ag. l. c. p. 247.)
Hab. Cape Van Diemen, *Labillardière*. (Nov. Holl. t. 259.)

56. **verruculosa**, *J. Ag.* (J. Ag. l. c. p. 248.)
Hab. Western Australia, *Mus. Paris.*

57. **paniculata**, *J. Ag.* (Plate CCXLVII.)
Hab. South coasts of Australia. Tasmania.

58? **decipiens**, *J. Ag.* (J. Ag. l. c. 249; Turn. t. 166.)
Hab. Tasmania, *R. Br.*

VIII. CYSTOPHYLLUM, *J. Agardh.*

59. **onustum**, *J. Ag.* (J. Ag. Sp. Alg. i. p. 230.)
Hab. Western Australia, *Mus. Paris.* Holdfast Bay, *Dr. Mueller.*

60. **muricatum**, *J. Ag.* (Plate CXXXIX.)
Hab. Western, south, and east coasts of New Holland. (Indian Ocean.)

61. **australe**, *Sond.* (Sond. in Linn. 25. p. 669.)
Hab. Holdfast Bay, *Dr. Mueller.*

(?) IX. FUCUS, *Linnaeus.*

62. **vesiculosus**, *Linn.* (Harv. Phyc. Brit. t. 204.)
Hab. Said to have been found on the Western coast of Australia: *very doubtful.* (Common throughout the *North* Atlantic and Pacific and Arctic Oceans. Rare and depauperated in the South Atlantic.)

X. FUCODIUM, *J. Agardh.*

63. **gladiatum**, *J. Ag.* (Plate LIII.)
Hab. South coasts of Australia. Tasmania. (New Zealand.)

64. **chondrophyllum**, *J. Ag.* (Sp. Alg. i. p. 203.)
Hab. South coasts of Australia. Tasmania. (New Zealand.)

65? **compressum**, *J. Ag.* (Sp. Alg. i. p. 204.)
Hab. Southern Ocean, *Hb. Agardh.*

XI. HORMOSEIRA, *Endlicher.*

66. **Banksii**, *Dcne.* (Plate CXXXV.)
Hab. South and south-east coasts of New Holland. Tasmania. (New Zealand.)

(?) XII. HIMANTHALIA, *Lyngbye.*

67? **australis**, *Sond.* (J. Ag. Sp. Alg. i. p. 197.)
Hab. Western Australia, *Preiss.* (A very doubtful plant.)

XIII. CARPOGLOSSUM, *Kützing.*

68. **quercifolium**, *J. Ag.* (Plate XLIII.)
Hab. Western Australia.

69. **angustifolium**, *Sond.* (J. Ag. Sp. i. p. 194.)
Hab. Western Australia.

70. **confluens**, *J. Ag.* (Plate CLIX.)
Hab. South coasts of Australia. Tasmania.

XIV. **MYRIODESMA**, *Decaisne.*

71. **serrulata**, *Dcne.* (PLATE CCXIX.)
HAB. Western Australia.

72. **latifolia**, *Harv.* (PLATE CCIV.)
HAB. Western Australia.

73. **integrifolia**, *Harv.* (Fl. Tasm. t. 186.)
HAB. Holdfast Bay, *Dr. Mueller.* Port Philip and Western Port. Tasmania.

74? **quercifolia**, *J. Ag.* (J. Ag. Sp. Alg. i. p. 192; Bory, Voy. Coq. t. 4.)
HAB. "New Holland" (?). (New Zealand.)

XV. **D'URVILLÆA**, *Bory.*

75. **potatorum**, *Aresch.* (PLATE CCC.)
HAB. South coasts of New Holland. Tasmania.

XVI. **SPLACHNIDIUM**, *Greville.*

76. **rugosum**, *Grev.* (PLATE XIV.)
HAB. South and east coasts of New Holland. Tasmania. (Cape of Good Hope. New Zealand. Indian Ocean.)

XVII. **NOTHEIA**, *Bailey and Harvey.*

77. **anomala**, *Bail. and Harv.* (PLATE CCXIII.)
HAB. South coast of New Holland. Tasmania. (New Zealand.)

Family II. SPOROCHNACEÆ.

XVIII. **CARPOMITRA**, *Kützing.*

78. **Cabreræ**, *Kütz.* (Harv. Phyc. Brit. t. 14.)
HAB. Sealer's Cove, *Dr. Mueller!* Kiama, New South Wales, Port Philip Heads; and Port Arthur, Tasmania, *W. H. H.* (Europe. North-west America. New Zealand.)

79. **inermis**, *Kütz.* (PLATE CCXXXVIII.)

XIX. **BELLOTIA**, *Harvey.*

80. **Eriophorum**, *Harv.* (PLATE LXIX.)
HAB. Port Philip Heads and Western Port, *W. H. H., Dr. Mueller!* Warnamboul, *H. Watts.* Tasmania.

XX. **ENCYOTHALIA**, *Harvey.*

81. **Cliftoni**, *Harv.* (PLATE LXII.)
HAB. Fremantle, Western Australia, *G. Clifton.*

XXI. **NEREIA**, *Zanardini.*

82. **australis**, *Harv.* (Fl. Tasm. ii. t. 188.)
HAB. Lefebre Peninsula and Sealer's Cove, *Dr. Mueller.* Geelong and Brighton, Port Philip and Western Port, *W. H. H.* Georgetown, Tasmania, *Gunn, W. H. H.*

XXII. **SPOROCHNUS**, *Agardh.*

83. **apodus**, *Harv.* (PLATE XCII.)
HAB. Georgetown, Tasmania, very rare, *W. H. H.*

84. **pedunculatus**, var. **australis**, *Harv.* (Harv. Phyc. Brit. t. 56.)
HAB. Warnamboul, *H. Watts.* Brighton Beach, Port Philip, and Western Port, *W. H. H.* (Coasts of Europe.)

85. **comosus**, *Ag.* (PLATE CIV.)
HAB. West and south coasts of Australia. Tasmania.

86. **Moorei**, *Harv.* (PLATE XIX.)
HAB. Port Jackson, New South Wales, *Charles Moore.*

87. **Herculeus**, *J. Ag.* (J. Ag. Sp. Alg. i. p. 175.)
HAB. Georgetown, Tasmania, very rare, *R. Gunn.*

88. **radiciformis**, *Ag.* (PLATE CCXXV.)
HAB. West and south coasts of Australia. Tasmania.

89. **scoparius**, *Harv.* (PLATE CCXXVI.)
HAB. West and south-west coasts of Australia.

XXIII. DESMARESTIA, *Lamouroux.*

90. **ligulata**, *Lamx.* (Harv. Phyc. Brit. t. 115.)
HAB. Western Port, *W. H. H.* (Atlantic Ocean, from the Faroe Islands to Morocco. Cape of Good Hope. Cape Horn. New Zealand. North-west America.)

Family III. LAMINARIACEÆ.

XXIV. MACROCYSTIS, *Agardh.*

91. **pyrifera**, *Ag.* (PLATE CCII.)
HAB. South coasts of New Holland, east of Cape Northumberland. Tasmania. (Southern and Pacific Oceans.)

XXV. ECKLONIA, *Horneman.*

92. **radiata**, *J. Ag.* (J. Ag. Sp. Alg. i. p. 146.)
HAB. West, south, and east coasts of New Holland. Tasmania. (New Zealand.) (Under this species I include, as varieties, *E. exasperata*, J. Ag., *E. Richardiana*, J. Ag., and *E. lanciloba*, Sond. in Linn. xxv. p. 666. If the characters relied on as distinguishing these forms be of specific value, it would be easy to multiply the species of *Ecklonia* to any extent, by selecting specimens grown at different levels and with different exposure.)

Family IV. DICTYOTACEÆ.

XXVI. HALISERIS, *Targioni.*

93. **Woodwardia**, *Ag.* (J. Ag. Sp. Alg. i. p. 116. Turn. Hist. t. 158.)
HAB. North coast of New Holland, *R. Brown.* (Singapore.)

94. **australis**, *Sond.* (Sond. in Linn. xxv. p. 664.)
HAB. Lefebre Peninsula, *Dr. Mueller.*

95. **pardalis**, *Harv.* (PLATE XXIX.)
HAB. Western Australia. (Kurrachee, Scind, *Capt. Pullen!*, *R.N.*)

96. **Muelleri**, *Sond.* (PLATE CLXXX.)
HAB. West, south, and east coasts of New Holland. Tasmania.

XXVII. PADINA, *Adanson.*

97. **Pavonia**, *Gaill.* (Harv. Phyc. Brit. t. 91.)
HAB. West, south, and east coasts of New Holland. Under this I in-

clude *P. Frazeri*, Grev., as well as *P. Commersoni*, and *P. D'Urvillæi*, Auct. (Found in most of the warmer seas; extending northward in Europe to the south coast of England.)

XXVIII. ZONARIA, *Agardh.*

98. **nigrescens,** *Sond.* (J. Ag. Sp. Alg. i. p. 108.)
HAB. West and south-west coasts of Australia. Perhaps a var. of *Z. lobata*, Ag.

99. **variegata,** *Mart.* (J. Ag. Sp. Alg. i. p. 108.)
HAB. Sealer's Cove, *Dr. Mueller!* Port Jackson, New South Wales, *W. H. H.* (The specimens require verification with Agardh's plant, which I have not seen.)

100. **flava,** *Ag.* (*Z. stuposa*, J. Ag. l. c. p. 110.)
HAB. Fremantle, Western Australia, *W. H. H.* (Aust. Alg. n. 77.) Coast of Spain, North Africa, Canary Islands, and South America.)

101. **Diesingiana,** *J. Ag.* (J. Ag. l. c. p. 109.)
HAB. New Holland, *Sieber.* Lefebre Peninsula, *Dr. Mueller.*

102. **microphylla,** *Harv.* (PLATE CXCV.)
HAB. South coast of New Holland.

103. **Sinclairii,** *Hook. f. and Harv.* (PLATE XLIX.)
HAB. Newcastle, New South Wales. (New Zealand, *Dr. Sinclair.*)

104. **interrupta,** *Ag.* (PLATE CXC.)
HAB. South coast of Australia. Tasmania. (New Zealand. Cape of Good Hope. Madagascar.)

XXIX. LOBOSPIRA, *Areschoug.*

105. **bicuspidata,** *Aresch.* (PLATE XXXIV.)
HAB. West and south coasts of New Holland.

XXX. TAONIA, *J. Agardh.*

106. **Solierii,** *J. Ag.* (J. Ag. Sp. Alg. i. p. 103.)
HAB. Lefebre Peninsula, *Dr. Mueller.* (Sond. in Linn. xxv. p. 664.) (Mediterranean Sea. Atlantic, near Tingin.)

XXXI. CUTLERIA, *Greville.*

107. **multifida,** *Grev.* (Harv. Phyc. Brit. t. 75.)
HAB. Lefebre Peninsula, *Dr. Mueller!* Abundant at Geelong, Port Philip, *W. H. H.* (Atlantic and Mediterranean. Coasts of Europe.)

XXXII. DICTYOTA, *Lamouroux.*

108. **fastigiata,** *Sond.* (PLATE LXXXII.)
HAB. Western Australia. Flinders Island.

109. **nævosa,** *Suhr.* (PLATE CLXXXVI.)
HAB. Tasmania. (Cape of Good Hope.)

110. **Kunthii,** *Ag.* (J. Ag. Sp. Alg. i. p. 95.)
HAB. Western Australia. Western Port, Victoria. (New Zealand. Peru.)

111. **paniculata,** *J. Ag.* (J. Ag. Sp. Alg. i. p. 91.)
HAB. West and south coasts of New Holland, common.

112. **ciliata,** *J. Ag.* (J. Ag. Sp. Alg. 1. p. 93.)
HAB. Western Australia, *W. H. H.* (West Indies. Florida.)

113. **dichotoma,** *DC.* (Harv. Phyc. Brit. t. 103.)
HAB. West, south, and east coasts of New Holland. Tasmania. (Common throughout the temperate ocean, north and south. Found, but less generally, in the warmer seas.)

114. **radicans,** *Harv.* (PLATE CXIX.)
HAB. Western Australia. Western Port, *Dr. Mueller.*

115. **furcellata,** *Ag.* (PLATE XXXVIII.)
HAB. West and south coasts of New Holland, common.

116. **minor,** *Sond.* (J. Ag. Sp. Alg. 1. p. 91.)
HAB. Western Australia, *Preiss.*

XXXIII. STILOPHORA, *J. Agardh.*

117. **rhizodes,** *J. Ag.* (Harv. Phyc. Brit. t. 70.)
HAB. Lefebre Peninsula and Holdfast Bay, *Dr. Mueller.* Tasmania, *R. Gunn.*

118. **Lyngbyæi,** *J. Ag.* (Harv. Phyc. Brit. t. 237.)
HAB. King George's Sound, abundant, *W. H. H.*

XXXIV. ASPEROCOCCUS, *Lamouroux.*

119. **Turneri,** *Hook.* (Harv. Phyc. Brit. t. 11.)
HAB. Fremantle. King George's Sound. Tasmania.

120. **sinuosus,** *Bory.* (J. Ag., Sp. Alg. i. p. 75.)
HAB. King George's Sound. Tasmania. (Mediterranean and Adriatic Seas. Gulf of Mexico. Brazil. Red Sea. Indian Ocean! Mauritius! Hongkong! Japan! Cape of Good Hope! New Zealand! Falkland Islands!)

121. **echinatus,** *Lamx.* (Harv. Phyc. Brit. t. 194.)
HAB. King George's Sound.

XXXV. HYDROCLATHRUS, *Bory.*

122. **cancellatus,** *Bory.* (PLATE XCVIII.)
HAB. Western Australia. Holdfast Bay, *Dr. Mueller.* (Tropical and subtropical seas. Loochoo Islands!)

Family V. CHORDARIACEÆ.

XXXVI. ADENOCYSTIS, *Hook. f. and Harvey.*

123. **Lessonii,** *Hook. f. and Harv.* (PLATE XLVIII.)
HAB. Port Arthur, Tasmania. (Falkland Islands. Kerguelen's Land. Auckland Islands and New Zealand.)

XXXVII. CHORDA, *Lamouroux.*

124. **Lomentaria,** *Lyngb.* (Phyc. Brit. t. 285.)
HAB. King George's Sound, *W. H. H.* (Generally diffused throughout the temperate and colder zones.)

XXXVIII. LIEBMANNIA, *J. Agardh.*

125. **australis,** *Harv. Alg. Austr. Exsicc. n.* 88. (Fl. Tasm. ii. p. 291.)
HAB. South coasts of Australia. Tasmania. (Perhaps not distinct from *L. Leveillei,* J. Ag. Sp. Alg. i. 61.)

XXXIX. MESOGLOIA, *Agardh.*

126. **virescens,** *Carm.* (Harv. Phyc. Brit. t. 82.)
HAB. Albany Island, North Australia, *Dr. Mueller!* West Australia, *G. Clifton!* Port Fairy, *W. H. H.* Tasmania, *W. Archer!* (Shores of Europe and North America. Friendly Islands, *W. H. H.* Japan and Loochoo, *C. Wright!* Red Sea.)

127. **filum,** *Harv.;* fronde simplici v. ramo uno alterove instructa, basi et apice attenuata, *Harv. Trans. R. I. Acad.* xxii. p. 536.
HAB. King George's Sound.

XL. CLADOSIPHON, *Kützing.*

128. **Chordaria,** *Harv.* (PLATE LX.)
HAB. South coast of Australia. Tasmania.

129. **nigricans,** *Harv.* (Fl. Tasm. ii. p. 292.)
HAB. Western Port, Victoria. Tasmania.

130. **zostericolus,** *Harv.* (Alg. Exsic. Austr. n. 98.)
HAB. King George's Sound. (Habit of *Mesogloia zostericola,* but with the hollow frond of *Cladosiphon.*)

XLI. MYRIOCLADIA, *J. Agardh.*

131. **Sciurus,** *Harv.* (PLATE LVIII.)
HAB. Port Fairy. Newcastle, New South Wales.

XLII. LEATHESIA, *J. E. Gray.*

132. **tuberiformis,** *Gray.* (Harv. Phyc. Brit. t. 324.)
HAB. Western Port, Victoria. Georgetown, Tasmania. (Shores of Europe. Japan, *C. Wright!* Cape of Good Hope, *W. H. H.*)

133. **umbellata,** *Menegh.* (Kütz. Sp. 543.)
HAB. Parasitical on *Cystophoræ,* etc. Holdfast Bay, *Dr. Mueller!* Port Philip Heads, *W. H. H.,* etc. (Mediterranean and Adriatic Seas.)

XLIII. MYRIONEMA, *Greville.*

134. **Leclancherii,** *Harv.* (Harv. Phyc. Brit. t. 41. A.)
HAB. Parasitical on Ulvæ, etc. Georgetown, Tasmania. (Shores of Europe.)

Family VI. ECTOCARPACEÆ.

XLIV. CLADOSTEPHUS, *Agardh.*

135. **spongiosus,** *Ag.* (Harv. Phyc. Brit. t. 138.)
HAB. Port Philip Heads! Tasmania! (Shores of Europe and North America. Cape of Good Hope. Cape Horn. Falkland Islands.)

136. **verticillatus,** *Ag.* (Harv. Phyc. Brit. t. 33.)
HAB. New Holland, *fide Agardh.* (Shores of Europe and North America.)

XLV. SPHACELARIA, *Lyngbye.*

137. **paniculata,** *Suhr.* (J. Ag. Sp. Alg. i. p. 36.)
HAB. South coasts of New Holland. Tasmania. [Under this I include *S. hordeacea,* H.; *S. scoparia,* Sond. in Linn. xxv. p. 662; *S. Muelleri,* Sond. l. c. xxvi. p. 507.] (New Zealand. Cape of Good Hope.)

138. **cirrhosa,** *Ag.* (Harv. Phyc. Brit. t. 178.)
HAB. Fremantle, Western Australia. Cape Riche. Port Jackson. (Shores of Europe and North America.)

139. **Novæ Hollandiæ,** *Sond.* (J. Ag. Sp. Alg. i. p. 32.)
HAB. Western Australia, *Preiss!* Cape Riche. Port Jackson and Kiama. Port Philip, *Dr. Mueller.* (New Caledonia, *M. Jolis!*)

140. **pulvinata,** *Harv.* (Fl. Nov. Zeal. ii. p. 221. t. 110. C.)
HAB. Parasitical on *Cystophoræ.* Port Philip, *Dr. Mueller!* (New Zealand.

XLVI. ECTOCARPUS, *Lyngbye.*

141. **siliculosus,** *Lyngb.* (Harv. Phyc. Brit. t. 162.)
HAB. Common on the west and south coasts of New Holland, and in Tasmania. (Very general throughout the temperate zones.)

142. **fasciculatus,** *Harv.* (Harv. Phyc. Brit. t. 273.)
HAB. Tasmania.

143. **sordidus,** *Harv.* (Hook. Fl. Tasm. ii. p. 294.)
HAB. Tasmania.

XLVII. DESMOTRICHUM, *Kützing.*

144. **plumosum,** *Kütz.* (Kütz. Sp. Alg. p. 470.)
HAB. Port Adelaide, *Dr. Mueller, fide* Sond. in Linn. xxv. p. 662.

Series II. RHODOSPERMEÆ.

Family VII. RHODOMELACEÆ.

XLVIII. CLAUDEA, *Lamouroux.*

145. **elegans,** *Lamx.* (PLATE I.)
HAB. Fremantle, Western Australia. Western Port, Victoria. Tamar, Tasmania.

146. **Bennettiana,** *Harv.* (PLATE LXI.)
HAB. Paramatta River, Port Jackson.

XLIX. MARTENSIA, *Hering.*

147. **australis,** *Harv.* (PLATE VIII.)
HAB. King George's Sound. Fremantle, Western Australia.

148. **elegans,** *Her.* (Ner. Austr. p. 73, tab. 43.)
HAB. Garden and Rottnest Island, Western Australia. Newcastle, New South Wales. (Port Natal, South Africa.)

149. **denticulata,** *Harv.* (PLATE CXXVII.)
HAB. Garden and Rottnest Islands, Western Australia.

150. **gigas,** *Harv.* (Fl. Tasm. ii. p. 294.)
HAB. In the Tamar, Tasmania.

L. THURETIA, *Decaisne.*

151. **quercifolia,** *Dcne.* (PLATE XL.)
HAB. West coast. South coast, from King George's Sound to Bass's Straits. Kangaroo Island, *Dr. Mueller.*

52. **teres,** *Harv.* (PLATE CXCI.)
HAB. Port Fairy and Port Philip Heads, Victoria. Western Port, *Dr. Mueller.* [*Dictyurus australis,* Sond.! is founded on a young or imperfect specimen of this plant.]

LI. **HALODICTYON,** *Zanardini.*

53. **australe,** *Harv.* (PLATE XCI.)
HAB. Fremantle, Western Australia.

54. **robustum,** *Harv.* (PLATE XXXVII. B.)
HAB. Fremantle, Western Australia. Western Port, Victoria, *Dr. Mueller!*

55. **arachnoideum,** *Harv.* (PLATE XXXVII. A.)
HAB. King George's Sound.

LII. **CLIFTONÆA,** *Harvey.*

56. **Lamourouxii,** *Harv.* (PLATE CLXXIX.)
HAB. West coast of Australia, very rare.

57. **pectinata,** *Harv.* (PLATE C.)
HAB. Garden Island, Western Australia.

LIII. **AMANSIA,** *Lamouroux.*

58. **glomerata,** *Ag.* (J. Ag. Sp. Alg. ii. p. 1111.)
HAB. Coast of Queensland, *Mr. Fitzalan, fide Dr. Mueller.* [Port Philip, *Dr. Mueller,* fide *Lenorm.*] (Sandwich Islands. Friendly and Fiji Islands. Loochoo Islands.)

59. **mamillaris,** *Lamx.* (J. Ag. Sp. ii. p. 1113.)
HAB. On the Australian coast, *Lamouroux.*

60. **Kuetzingioides,** *Harv.* (PLATE LI.)
HAB. Rottnest Island, Western Australia. (*Vidalia Kuetzingioides,* J. Ag. ii. 1128.)

61. **pinnatifida,** *Harv.* (PLATE CCXXII.)
HAB. King George's Sound.

62. **linearis,** *Harv.* (PLATE CVIII.)
HAB. Glenelg. Port Fairy. Warnamboul, *H. Watts.* (*Lenormandia linearis,* J. Ag. ii. p. 1102.)

LIV. **LEVEILLEA,** *Decaisne.*

63. **Schimperi,** *Dcne.* (PLATE CLXXI.)
HAB. Fremantle, Western Australia. (Red Sea. Ceylon. Singapore. Tuticoreen.)

LV. **POLYZONIA,** *Suhr.*

64. **Sonderi,** *Harv.* (Ner. Austr. p. 72.)
HAB. Fremantle, Western Australia, *Preiss, W. H. H., G. Clifton.* Warnamboul, *H. Watts.* Macdonnell Bay, *Rev. S. S. Wood.*

65. **incisa,** *J. Ag.* (PLATE XLII. A.)
HAB. South coast, from Cape Northumberland to Bass's Straits. Tasmania.

66. **flaccida,** *Harv.* (PLATE XLII. B.)
HAB. Fremantle and King George's Sound, Western Australia. Cape Riche. Sealer's Cove, *Dr. Mueller.*

[illegible] **[illegible]**, *Agardh.*

[illegible] **[illegible]**, *J. Ag.* Sp. Alg. i. [illegible] *Lecanorae fraxinifolia.* PLATE [illegible]

HAB. Western Australia. Mauritius. Indian Ocean. Ceylon.)

[illegible] **[illegible]**, *Lamouroux.*

[illegible] **[illegible]**, *J. Ag.* Sp. Alg. i. p. [illegible]

HAB. [illegible] New Holland. *R. Brown.*

[illegible] **[illegible]**, *Lamx.* *J. Ag.* Sp. Alg. i. [illegible]

HAB. Western Australia. [illegible]

[illegible] **Cliftonii**, *Harv.* [illegible] *sine marginibus tortis*, apicibus involutis, [illegible] costalatis [illegible]

HAB. Western Australia. *G. Clifton.* More delicately membranaceous than [illegible] with much slender marginal teeth.

[illegible] **KUTZINGIA**, *Sonder.*

[illegible] **[illegible]**, *Sond.* PLATE [illegible]

HAB. Western Australia.

[illegible] **[illegible]**, *Harv.* PLATE [illegible]

HAB. Rottnest Island, Western Australia, very rare.

LIX. LEMORMANDIA, *Sonder.*

[illegible] **spectabilis**, *Sond.* PLATE CLXXXI.)

HAB. Western Australia.

[illegible] **spectabilis**, var. **conervia**, *Harv.*; phyllodiis obovato-obovatis latissimis [illegible]

HAB. Garden Island, Western Australia, *G. Clifton.*

[illegible] **spectabilis**, var. **latifolia**, *Harv.* (*L. latifolia*, Ner. Austr. p. 19.)

HAB. Western Australia. *Mylne.*

[illegible] **spectabilis**, var. **angustifolia**, *Harv.*; phyllodiis linearibus 3–4 uncias longis vix semilineam latis [illegible]

HAB. Garden Island, Western Australia, *W. H. H.*, *G. Clifton.*

[illegible] **Mueller**, *Sond.* PLATE XLV.)

HAB. Southern coast of Australia. Eivoli Bay, *Dr. Mueller.*

[illegible] **marginata**, *Harv.* (PLATE CCXXXV.)

HAB. Tasmania.

176. **proliferа**, *J. Ag.* (Sp. ii. p. 1203. *Rytiphlea simplicifolia*, Harv. PLATE CCXLVI.)

HAB. South coasts of New Holland. Wilson's Promontory and Western Port. *Dr. Mueller.*

LX. POLYPHACUM, *Agardh.*

177. **proliferum**, *Ag.* (PLATE CLXXXVIII.)

HAB. Western Australia.

178. **Smithiae**, *Harv.* (Ner. Austr. p. 17. t. 3.)

HAB. South coast of Australia. Tasmania.

LXI. **JEANNERETTIA**, *Hook. f. and Harvey.*

179. **lobata**, *Hook. f. and Harv.* (PLATE XXXIII.)
HAB. Western and southern coasts of Australia. Lefebre Peninsula, *Dr. Mueller.* Tasmania.

LXII. **POLLEXFENIA**, *Harvey.*

180. **pedicellata**, *Harv.* (Ner. Austr. p. 22, t. 5.)
HAB. West and south coasts of Australia. Tasmania.

LXIII. **RHODOSERIS**, *Harvey.*

181. **cartilaginea**, *Harv.* (*Pollexfenia cartilaginea*, Ner. Austr. p. 23.)
HAB. Western Australia, *Mylne.* (Probably not a *Rhodomeleous* genus. Perhaps rather related to *Thamnoclonium ?*)

LXIV. **SARCOMENIA**, *Sonder.*

182. **delesserioides**, *Sond.* (PLATE CXXI.)
HAB. Garden Island, Western Australia. Port Philip Heads. Guichen Bay, *Dr. Mueller.*

183. **hypneoides**, *Harv.* (PLATE XII.)
HAB. Garden Island, Western Australia.

184. **tenera**, *J. Ag.* (Sp. ii. p. 1264. *Dasya tenera*, Harv. PLATE CCLVII.)
HAB. West and south coasts of New Holland, common.

185. **dasyoides**, *Harv.* (J. Ag. Sp. Alg. ii. p. 1263.)
HAB. Port Philip and Western Port, *W. H. H., Dr. Mueller !*

186. **Victoriæ**, *J. Ag.* (Sp. Alg. ii. p. 1262. *Pol. Victoriæ*, Harv. ms.)
HAB. Port Philip and Western Port, *W. H. H., Dr. Mueller !*

187. **mutabilis**, *J. Ag.* (Sp. Alg. ii. p. 1261. *Pol. mutabilis*, Harv.)
HAB. Western Australia. Warnamboul, *H. Watts !*

188. **rhizocarpa**, *Harv.;* pusilla, parasitica, roseo-purpurea, flaccida, fronde brevissima (vix ¼ unciam alta) e basi ramosa corticata, ramis alterne divisis subpinnatis ramellis vestitis, ramellis simplicissimis elongatis obtusis articulatis, articulis diametro 5–8-plo longioribus cylindraceis, ceramidiis urceolatis numerosis ad basin frondis v. latera ramorum sessilibus.
HAB. Parasite on *Cystophyllum muricatum* at Western Australia, *G. Clifton !*

LXV. **ACANTHOPHORA**, *Lamouroux.*

189. **Thierii**, *Lamx.* (Ner. Austr. p. 34.)
HAB. Bass's Straits, *Dr. Mueller.* (Tropical Pacific and Atlantic. Indian Ocean. Loochoo Islands. West Indies.)

190. **dendroides**, *Harv.;* caule incrassato indiviso inferne nudo superne ramis alternis spiraliter evolutis onusto, ramis decompositis, ramulis spinosis, spinulis sparsis, ceramidiis ovatis subsessilibus. *Trans. R. S. Acad.* xxii. *p.* 538.
HAB. Rottnest Island, Western Australia, *W. H. H., G. Clifton.* (Ceylon.)

191. **arborea**, *Harv.* (PLATE CXXXII.)
HAB. In the Tamar, above Georgetown, Tasmania.

LXVI. **DICTYMENIA**, *Greville.*

192. **Sonderi**, *Harv.* (PLATE XXI.)
HAB. Garden Island. Western Australia.

193. **tridens,** *Grev.* (Turn. Hist. t. 255.)
HAB. Western Australia. Lefebre Peninsula, *Dr. Mueller!* Warnamboul, *H. Watts.* Western Port, *Dr. Mueller.*

194. **Harveyana,** *Sond.* (Ag. Sp. ii. p. 1079. Ner. Austr. t. 7.)
HAB. South coasts and Tasmania. Rare in Western Australia.

194*a*. **Harveyana,** var. **flabelligera,** *Harv.*; fronde supradecomposita plumosa, pinnulis ultimis apice flabelligeris, flabellulis cuneatis subdentatis petiolatis!
HAB. Carnac Island, Western Australia, *G. Clifton,* 18 Nov. 1855.

195. **pectinella,** *Harv.* (Ag. Sp. ii. 1084.)
HAB. Garden Island, Western Australia, *W. H. H., G. Clifton!*

LXVII. HETEROCLADIA, *Decaisne.*

196. **australis,** *Dcne.* (J. Ag. Sp. ii. p. 1250.)
HAB. Western Australia, *Herb. Paris.*

LXVIII. RYTIPHLŒA, *Agardh.*

197. **australasica,** *Mont.* (PLATE XXVII.)
HAB. West and south coasts. Tasmania, *C. Stuart.*

198. **elata,** *Harv.* (PLATE CCXXXVI.)
HAB. Western Australia. Port Philip Heads. M'Donnell Bay, *Mrs. Wehl!*

199. **aculeata,** *Ag.* (J. Ag. Sp. Alg. ii. 1087. *Rhodomela spinulosa,* Harv. PLATE CXXX.)
HAB. Fremantle, Western Australia. Cape Riche.

LXIX. ALSIDIUM, *Agardh.*

200. **comosum,** *Harv.* (PLATE CCLXX.)
HAB. Vasse, Western Australia, *Mrs. Brown.*

LXX. RHODOMELA, *Agardh.*

201. **Trigenea,** *Harv.* (PLATE CXXVI.)
HAB. Western Australia. Glenelg river, south coast, *Dr. Curdie.* Warnamboul, *H. Watts.* M'Donnell Bay, *Mrs. Wehl!*

202. **periclados,** *Sond.* (PLATE XXVIII.)
HAB. Brighton, Port Philip. Twofold Bay, *Dr. Mueller!* Tasmania.

203? **Preissii,** *Sond.* (Sond. in Pl. Preiss. ii. p. 182.)
HAB. Western Australia, *Preiss.*

LXXI. CHONDRIA, *Agardh* (*Harv.* reform.).

Sect. 1. CLAVATÆ: *ramulis clavatis truncatis obtusisve.*

204. **clavata,** *Harv.* (PLATE CLXXXIX.)
HAB. West and south coasts of Australia, common. Tasmania.

204*a*. **clavata,** *β.* **dendroides,** *Harv.* (*C. dendroides,* Harv. Alg. Exsic. n. 160.)

205. **dasyphylla,** *Ag.* (Fl. Tasm. ii. p. 297.)
HAB. Fremantle, Western Australia, *G. Clifton.* King George's Sound, Port Fairy and Port Philip. Cape Shank, *Mrs. Barker.* Brisbane river, *Dr. Mueller,* 26.

205*a*. **dasyphylla,** var. **sedifolia,** *Harv.* (Ner. Bor. Amer. ii. p. 19, t. 18, f. G.)
HAB. King George's Sound.

206. **debilis,** *Harv.;* fronde parvula (1–2-unciali) purpurea vage dichotoma v. flexuoso-ramosa, ramis alternis patentibus filiformibus apice clavatis, ramulis paucis sparsis clavæformibus, tetrasporis in apicibus ramulorum nidulantibus magnis.
HAB. On *Zostera;* King George's Sound, *W. H. H.* (cum priore).

Sect. 2. FUSIFORMES: *ramulis basi et apice acutis.*

207. **fusifolia,** *Hook. f. and Harv.* (Fl. Tasm. ii. p. 298.)
HAB. Tasmania, *Dr. Hooker, Mr. M'Gowan.*

208. **tenuissima,** *Ag.?* (Fl. Tasm. ii. p. 297.)
HAB. Georgetown, Tasmania, *R. Gunn.*

209. **lanceolata,** *Harv.* (PLATE CCXXXIX.)
HAB. On *Zostera,* Rottnest Island, Western Australia, *W. H. H.*

210. **bulbosa,** *Harv.* (Fl. Tasm. ii. p. 297.)
HAB. Tasmania.

211. **(?) rubra,** *Harv.* (PLATE CCLXXX.)
HAB. Western Australia, *G. Clifton.*

Sect. 3. VERTICILLATÆ: *ramis articulato-constrictis, ramulis verticillatis.*

212. **Opuntioides,** *Harv.* (Fl. Tasm. ii. t. 189.)
HAB. West and south coasts of Australia, common. Tasmania.

213. **verticillata,** *Harv.* (PLATE CII.)
HAB. Western Australia. Port Fairy, Victoria. Georgetown, Tasmania.

214. **Umbellula,** *Harv.* (PLATE CXLVII.)
HAB. Western Australia.

LXXII. **BOSTRYCHIA,** *Montagne.*

215. **rivularis,** *Harv.* (PLATE CLXXVI. B.)
HAB. In the river Moy, Port Fairy, Victoria. (South Carolina, North America.)

216. **mixta,** *Hook. f. and Harv.* (PLATE CLXXVI. *A.*)
HAB. Port Arthur, Tasmania. (Akaroa, New Zealand. Cape of Good Hope.)

217. **Harveyi,** *Mont.* (PLATE CCXCII.)
HAB. Tasmania, *C. Stuart.* Sealer's Cove, *Dr. Mueller.* Yarra, *Dr. Mueller!* Chiloe. New Zealand. (*B. australasica,* Sond.! Linn. xxvi. p. 527.)

LXXIII. **POLYSIPHONIA,** *Greville.*

Subgenus 1. OLIGOSIPHONIA. *Siphones primarii* 4, *rarissime* 5.

Sect. 1. ELONGATÆ. *Caulis corticatus (inarticulatus). Ramuli articulati.*

218. **Hookeri,** *Harv.* (Ner. Austr. p. 40. t. 12.)
HAB. Port Philip. Tasmania, abundant.

219. **Mallardiæ,** *Harv.* (Ner. Austr. p. 40. t. 13.)
HAB. Western Australia. South coast, from Port Fairy to Western Port. Tasmania.

220. **Hystrix,** *Harv.* (Ner. Austr. p. 41. t. 14.)
HAB. West and south coasts of Australia. Tasmania.

221. **crassiuscula,** *Harv.* (Fl. Tasm. ii. p. 299.)
HAB. East coast of Tasmania.

222. **tasmanica,** *J. Ag.* (Sp. Alg. ii. p. 1018.)
HAB. Georgetown, Tasmania, on the flats.

Sect. 2. DICHOTOMÆ. *Tota frons pellucide articulata, subdichotoma, decomposite ramosa. Ramuli tetrasiphonii.*

223. **Roeana,** *Harv.* (PLATE XXXV.)
HAB. Fremantle, Western Australia.

224. **abscissa,** *Hook. f. and Harv.* (Ner. Austr. p. 43; also *P. microcarpa*, Hook. f. and Harv. Fl. Ant. ii. p. 479. t. 182. f. 3.)
HAB. Tasmania, *R. Gunn.* Port Philip, *Mr. Rawlinson!* at Williamstown, *W. H. H.* 190, 191. (Cape Horn. New Zealand.)

225. **havanensis,** *Mont.* (Ner. Bor. Amer. ii. p. 34.)
HAB. Western Australia. Lake King, South Australia, *Dr. Mueller!* (Havana, Cuba. Key West, Florida.)

226. **ferulacea,** *Suhr.* (J. Ag. Sp. ii. p. 980.)
HAB. Western Australia. Table Cape, Tasmania, *Miss Mackenzie.* (Gulf of Mexico. Indian Ocean.)

227. **laxa,** *Harv.* (Fl. Tasm. ii. p. 300.)
HAB. East coast, Tasmania, *R. Gunn.*

228. **succulenta,** *Harv.* (Fl. Tasm. ii. p. 300.)
HAB. Georgetown, Tasmania, *R. Gunn! M'Gowan!* Port Philip, *Dr. Mueller, W. H. H.* (189). Sealer's Cove, *Dr. Mueller.*

229. **Blandi,** *Harv.* (PLATE CLXXXIV.)
HAB. Port Philip.

230. **mollis,** *Harv.* (Ner. Austr. p. 43.)
HAB. South coast of Australia. Port Philip. River Hopkins, Warnamboul, *H. Watts.* Tasmania, in the Tamar, abundant. Western Australia, on bivalve shells, *G. Clifton.*

231. **infestans,** *Harv.* (J. Ag. Sp. Alg. ii. p. 959.)
HAB. Parasitical on *Polyphysa peniculus*, at King George's Sound.

232. **rufolanosa,** *Harv.* (J. Ag. Sp. ii. p. 930.)
HAB. On stems of *Cymodocea antarctica*, at King George's Sound.

233. **vagabunda,** *Harv.* (Fl. Tasm. ii. p. 300.)
HAB. Eagle-Hawk Neck, Tasmania.

234. **scopulorum,** *Harv.* (Ag. Sp. ii. p. 940.)
HAB. Littoral rocks, Rottnest, Western Australia.

235. **implexa,** *Hook. f. and Harv.* (Ag. Sp. ii. 945.)
HAB. King George's Sound. (New Zealand.)

236. **prostrata,** *Harv.* (Ag. Sp. ii. 915.)
HAB. Parasitical on *Zonaria nigrescens*, Western Australia.

Sect. 3. GLOMERULATÆ. *Tota frons* pellucide *articulata, subpinnata. Rami ramulis minutis multifidis tetrasiphoniis densissime onusti.*

237. **glomerulata,** *Endl.* (Ag. Sp. ii. p. 1016.)
HAB. North coast of New Holland, *Gaudichaud.* (Mauritius, *Telfair.* India, *Wight.* Ceylon and Friendly Islands, *W. H. H.* Japan, *C. Wright.*)

Subgenus 2. POLYSIPHONIA.—*Siphones primarii sex v. sæpissime plures.*

Sect. 4. BYSSOIDEÆ.—*Frons* pellucide *articulata, alterne ramosa, polysiphonia. Ramuli* monosiphonii, *dichotomi.*

238. **Cladostephus,** *Mont.* (PLATE CLIV.)
HAB. West and south coasts, common. Tasmania. (New Zealand. Lord Auckland's Island.)

Sect. 5. PENNATÆ.—*Siphones* 12–16. *Frons* pellucide *articulata, rosea v. purpurea, cartilaginea v. flaccida, sæpius disticha, pinnatim composita. Ramuli simplicissimi, subulati, laterales, alterni v. secundi, raro quaquaversi, polysiphonii.*

239. **dendritica,** *Ag.* (Harv. Ner. Austr. p. 47.)
HAB. Port Philip, *Dr. Mueller.* (New Zealand. South America.)

240. **pennata,** *Ag.* (Ag. Sp. Alg. ii. p. 928.)
HAB. King George's Sound. Port Jackson, *C. Moore.* (Mediterranean Sea.)

241. **versicolor,** *Hook. f. and Harv.* (Ner. Austr. p. 48. t. 16.)
HAB. West and south coasts of Australia. Tasmania. (Very variable in size; sometimes capillary, sometimes ultra-setaceous.)

242. **monilifera,** *Hook. f. and Harv.* (Ner. Austr. p. 48. t. 16.)
HAB. Tasmania, *R. Gunn.*

243. **rostrata,** *Sond.* (PLATE CCXLII.)
HAB. Western Australia, common.

244. **filipendula,** *Harv.* (Ag. Sp. ii. p. 920.)
HAB. Western Australia, *W. H. H., G. Clifton.* Port Fairy, *W. H. H.*

245. **pectinella,** *Harv.* (Ag. Sp. Alg. ii. 918.)
HAB. On mud, near high-water mark, King George's Sound.

246. **ericoides,** *Harv.* (PLATE CLXXXV. A.)
HAB. Port Arthur, Tasmania.

247. **Calothrix,** *Harv.* (PLATE CLXXXV. C.)
HAB. Tidal rocks, at King George's Sound.

248. **prorepens,** *Harv.* (PLATE CLXXXV. B.)
HAB. King George's Sound, parasitical on *Dicranema Grevillei.* (Algoa Bay, South Africa.)

249. **Pecten,** *Aresch.* (Ag. Sp. Alg. ii. 918.)
HAB. Port Adelaide, *Herb. Areschoug.*

Sect. 6. CANCELLATÆ.—*Siphones sæpissime* 7, *raro* 8–9. *Frons fusca, siccitate nigrescens, sulcata, fruticosa, vage ramosissima, rarius dichotoma. Ramuli decompositi.*

250. **nigrita,** *Sond.* (Ag. Sp. Alg. ii. 1048.)
HAB. Western Australia.

251. **caucellata,** *Harv.* (Ner. Austr. p. 51. t. 15.)
HAB. West and south coasts, common. Tasmania.

252. **frutex,** *Harv.* (Ag. Sp. Alg. ii. 1047.)
HAB. South coasts of Australia. Tasmania.

253. **fuscescens,** *Harv.* (Ag. Sp. ii. 1050.)
HAB. Port Philip. Tasmania.

254. **Patersonis,** *Sond.* (*P. spinosissima,* Harv., PLATE CLV.)
HAB. Cape Paterson, *Dr. Mueller,* 1853. Port Fairy. Tasmania.

255. **Porfex,** *Harv.* (PLATE XCVI.)
HAB. Western Australia. (Tanega, near Loochoo Islands.)

Sect. 7. ATRO-RUBESCENTES.—*Siphones* 10-16 *v. plures. Frons atro-rubens, siccitate obscurior, cylindracea, vage v. pinnatim ramosa. Ramuli decompositi.*

256. **atracapilla,** *J. Ag.* (Sp. Alg. ii. 1054.)
HAB. King George's Sound.

257. **aurata,** *Harv.* (Ag. Sp. Alg. ii. 1026.)
HAB. King George's Sound.

258. **neglecta,** *Harv.* (Ag. Sp. ii. 942.)
HAB. King George's Sound.

259. **simpliciuscula,** *Crouan.* (Ag. Sp. Alg. ii. p. 944.)
HAB. King George's Sound. (Europe.)

260? **cæspitula,** *Sond.* (Linn. xxvi. p. 524.)
HAB. Wilson's Promontory, *Dr. Mueller.*

261? **amœna,** *Sond.* (Linn. xxvi. p. 525.)
HAB. Port Philip, *Dr. Mueller.*

LXXIV. DASYA, *Agardh.**

Sect. 1. COMPSOTEIA.—*Frons plus minus articulata, polysiphonia, coccinea, pinnato-dichotoma, ramis minoribus in ramellos dichotomos monosiphonios apice solutis.*

262. **Gunniana,** *Harv.* (Ner. Austr. p. 59. t. 17.)
HAB. Western Australia. Port Philip. Tasmania.

262*a*. **Gunniana,** var. **Lawrenciana,** *Harv.* (Ner. Austr. p. 60. t. 18.)
HAB. South coast of Australia, from Warnamboul to Cape Shank. Tasmania.

263. **capillaris,** *Harv.* (Ner. Austr. p. 60. t. 19.)
HAB. Tamar, at Georgetown, Tasmania.

Sect. 2. RHODONEMA.—*Frons sæpissime inarticulata, nunc articulata, cylindracea, vage ramosa, ramis ramulisque plus minus ramellis dichotomis monosiphoniis quadrifariis vestitis.*

264. **mollis,** *Harv.* (Ner. Bor. Amer. ii. p. 62.)
HAB. King George's Sound, rare. (Keys of Florida.)

265. **villosa,** *Harv.* (Ner. Austr. t. 20.)
HAB. West and south coasts, abundantly. Tasmania. [Very variable in size and ramification.]

265*a*. **villosa,** var. **macroura,** *Harv.*; fronde longissima crassissima (1–3 lineas diametro), ramis filiformibus simplicibus villosis, ramulis nullis.
HAB. West and south coasts. Tasmania.

265*b*. **villosa,** var. **ramulosa,** *Harv.*; fronde crassissima (1–3 lineas diametro), ramis virgatis crebre ramuliferis villosis, ramulis patentibus quoquoversis.
HAB. Western Australia, *G. Clifton.* (Like var. *macroura*, except that the primary branches are beset with branchlets, long and short intermixed.)

* *Dasya crouanioides,* Sond. in Linn. xxv. p. 703, judging by description, is probably some species of *Crouania.*

266. **hapalathrix,** *Harv.* (PLATE LXXXVIII.)
HAB. Georgetown, Tasmania. Port Philip.

267. **Feredayæ,** *Harv.* (PLATE CLXXVII.)
HAB. Georgetown, Tasmania, *Mrs. Fereday.*

268. **Haffiæ,** *Harv.* (PLATE CXLIII.)
HAB. Philip Island, Western Port. Table Cape, Tasmania.

269. **naccarioides,** *Harv.* (Ner. Austr. t. 22.)
HAB. West and south coasts. Tasmania. (The figure in Ner. Austr., drawn from a very poor specimen, does not do justice to this very handsome plant.)

270. **decipiens,** *Sond.* (Linn. xxvi. p. 526.)
HAB. Port Philip, *Dr. Mueller.* (Said to be very nearly allied to *D. elongata* and *D. naccarioides.*)

271. **sarcocaulon,** *Harv.* (PLATE CCLXXVII.)
HAB. Western Australia, *G. Clifton.*

272. **Cliftoni,** *Harv.* (PLATE III.)
HAB. Fremantle, Western Australia, *G. Clifton.* King George's Sound, *W. H. H.*

273. **elongata,** *Sond.* (Ner. Austr. t. 23.)
HAB. West and south coasts, common.

274. **proxima,** *Harv.;* fronde crassa corticata vage ramosa, ramis elongatis virgatis sæpius simplicibus, ramis omnibus ramulos breves quoquoversum emittentibus, ramulis corticatis simplicibus v. iterum ramosis, junioribus ramellis vestitis, ramellis subverticillatis dichotomis e basi lata conspicue attenuatis, axillis patentibus, apicibus filiformibus obtusis, articulis diametro 3–4-plo longioribus, ceramidiis ramulos primarios terminantibus urceolatis ore brevi prominulo. *Harv. in Trans. R. Acad.* xxii. p. 542.
HAB. Middleton Bay, King George's Sound, *W. H. H.*

275. **Tasmanica,** *Sond.* (Fl. Tasm. ii. p. 302.)
HAB. Georgetown, Tasmania. Western Port, *Dr. Mueller.*

276. **frutescens,** *Harv.* (Ag. Sp. ii. p. 1225.)
HAB. Rottnest, Western Australia, on *Zostera* leaves. King George's Sound. (*D. collabens!*, Harv. in Trans. R. I. Acad. (*excl. syn.*) is now referred here.)

277. **struthiopenna,** *J. Ag.* (Sp. Alg. ii. p. 1193.)
HAB. King George's Sound, *W. H. H.* (By me regarded as a var. of *D. Muelleri;* by J. Agardh as a species.)

278. **Muelleri,** *Sond.* (PLATE XXXI.)
HAB. West and south coasts, common. Tasmania.

279. **multiceps,** *Harv.* (Ag. Sp. Alg. ii. 1195.)
HAB. Rottnest Island, Western Australia. Fremantle, Western Australia, *G. Clifton.* (Like a small state of *D. Muelleri,* but easily known by its pellucidly-articulate primary branches, etc.)

280. **Archeri,** *Harv.* (Fl. Tasm. ii. p. 304.)
HAB. Georgetown, Tasmania, *W. Archer.*

281. **Wrangelioides,** *Harv.* (PLATE CLXXIV.)
HAB. Fremantle, Western Australia.

282. **Callithamnion,** *Harv.* (*Pol. Callithamnion,* Sond. Ner. Austr. p. 45.)
HAB. Western Australia, abundant.

Sect. 3. STICHOCARPUS.—*Frons plus minus articulata, polysiphonia, coccinea, decomposite pinnata, sæpissime disticha, pinnis ultimis (ramellis) monosiphoniis simplicissimis.*

283. **hormoclados,** *J. Ag.* (Ner. Austr. 26; also *D. ceramioides*, H.)
HAB. Very abundant in the Tamar, Tasmania. South coast of Australia. (Extremely variable in size and ramification. Agardh regards *D. ceramioides* as a species.)

284. **scopulifera,** *Harv.* (PLATE CCLXXI.)
HAB. Western Australia, *G. Clifton.*

285. **pachyclada,** *Harv.*; fronde elata robusta cartilaginea, caule simplici ramisque alternis virgatis crassissime corticatis opacis glabris, ramis basi attenuatis bi-tripinnatis crassis, pinnis gracilibus inarticulatis, pinnulis capillaribus alternis crebris flexuoso-articulatis articulis diametro duplo longioribus, ramellis roseis succulentibus simplicibus obtusis solitariis v. 2–3-natis, articulis ramellorum ad genicula constrictis diametro 2–3-plo longioribus.
HAB. Western Australia, *G. Clifton.*

286. **crassipes,** *Harv.* (Ag. Sp. Alg. ii. p. 1198.)
HAB. Jetty Reef, Rottnest, *W. H. H.* Carnac, *G. Clifton.*

287. **Curdieana,** *Harv.* (Ag. Sp. Alg. ii. p. 1189.)
HAB. South Australia, *Dr. Curdie!*

288. **urceolata,** *Harv.* (J. Ag. Sp. Alg. ii. p. 1208.)
HAB. Port Fairy, Victoria, *W. H. H.*

289. **australis,** *Ag.* (Ag. Sp. Alg. ii. p. 1183.)
HAB. Port Jackson, New South Wales.

290. **pellucida,** *Harv.* (Ner. Austr. t. 27.)
HAB. Port Philip, Victoria. (Cape of Good Hope.)

Sect. 4. LOPHOTHALIA.—*Frons articulata v. inarticulata, tetrasiphonia, virgata, alterne ramosa, purpurea, nuda v. ramellis simplicissimis monosiphoniis verticillatis vestita. Stichidia e ramis enata, ramellis vestita.*

291. **Bolbochæte,** *Harv.* (Ner. Austr. t. 25.)
HAB. Western Port, Victoria. Georgetown, Tasmania.

292. **verticillata,** *Harv.* (Ner. Austr. t. 24.)
HAB. Georgetown, Tasmania. Brighton, Port Philip. (Rare.)

293. **Lenormandiana,** *Ag.* (Sp. Alg. ii. p. 1258.)
HAB. Mouth of Glenelg river, *Hb. Lenormand.*

294. **Lallemandi,** *Mont.* (Ag. Sp. Alg. ii. p. 1231.)
HAB. Rottnest Island, Western Australia, rare. (Red Sea.)

Family VIII. LAURENCIACEÆ.

LXXV. DELISEA, *Lamouroux.*

295. **elegans,** *Mont.* (Ner. Austr. t. 34.)
HAB. South coast of Australia. Wilson's Promontory, *Dr. Mueller.* Tasmania. (New Zealand.)

296. **pulchra,** *Mont.* (PLATE XVI.)
HAB. West, south, and east coasts of Australia. Tasmania. (Kerguelen's Land.)

297. **serrata,** *Kütz.* (J. Ag. Sp. Alg. ii. p. 784.)
HAB. New Holland, *Sieber.*

298. **fimbriata,** *Lamx.* (J. Ag. Sp. Alg. ii. p. 785.)
HAB. New Holland, *Herb. Lamouroux.*

299. **hypneoides,** *Hook.* (PLATE CXXXIV.)
HAB. Western Port, Bass's Straits, *W. H. H., Dr. Mueller.* Georgetown, Tasmania.

LXXVI. ASPARAGOPSIS, *Montaigne.*

300. **Sanfordiana,** *Harv.* (PLATE VI.)
HAB. Rottnest and Garden Islands, Western Australia.

301. **armata,** *Harv.* (PLATE CXCII.)
HAB. West, south, and east coasts of Australia, abundant. Tasmania. (New Zealand.)

LXXVII. PTILONIA, *J. Agardh.*

302. **australasica,** *Harv.* (Fl. Tasm. ii. p. 305. t. 190, A.)
HAB. South coast, from Port Fairy and Warnamboul (*H. Watts*) to Cape Shank (*Mrs. Barker*). Williamstown, Port Philip, *Rawlinson.* Tasmania.

LXXVIII. CLADHYMENIA, *Harvey.*

303. **conferta,** *Harv.* (PLATE CXLIV.)
HAB. South coast, from Port Fairy to Western Port. Tasmania.

LXXIX. LAURENCIA, *Lamouroux.*

* *Fronde terete, ramis quoquoversum egredientibus, ramulis alternis.*

304. **Forsteri,** *Grev.* (J. Ag. Sp. Alg. ii. p. 744.)
HAB. West and south coasts, common. Tasmania.

304*a*. **Forsteri,** var. **elata,** *Sond.;* fronde 6–10 uncias alta, ramis strictioribus, ramulis longis filiformibus sæpius simplicibus.
HAB. Western Australia. Port Fairy, Victoria.

305. **affinis,** *Sond.* (J. Ag. Sp. Alg. ii. p. 744.)
HAB. Western Australia, *Preiss!* [Species valde dubia.]

306. **filiformis,** *Mont.* (J. Ag. Sp. Alg. ii. p. 745.)
HAB. Western Australia, *Mus. Paris, G. Clifton?* [Mr. Clifton's specimens, referred to this species, are more robust and less dichotomous than *L. Forsteri;* more copiously branched, less rigid, and of brighter colour than *L. heteroclada,* growing epiphytically on *Cymodocea antarctica.* I have not seen any authentic specimens of Agardh's plant.] Tasmania, *Stuart* (fide *Sond.*).

307. **heteroclada,** *Harv.* (PLATE CXLVIII.)
HAB. On rocks. West and south coasts of Australia. M'Donnell Bay, *Mrs. Wehl.*

** *Fronde terete pinnatim ramosa, ramis quoquoversum egredientibus, ramulis sæpius oppositis v. verticillatis.*

308. **Tasmanica,** *Hook. f. and Harv.* (Ner. Austr. p. 84.)
HAB. South coasts of Australia. Tasmania.

309. **obtusa,** *Lamx.* (J. Ag. Sp. Alg. ii. p. 750.)
HAB. King George's Sound and Cape Riche, *W. H. H.* Tasmania. (Atlantic and Mediterranean coasts of Europe. East coast, North America.)

309*a*. **obtusa,** var. **regia,** *Harv.;* purpurea, ramis primariis indivisis filiformibus, secundariis brevibus patentibus, ramulis inferioribus fasciculato-corymbosis. *L. regia,* Harv. mss. in Austr. Alg. Exsicc. n. 237.
HAB. Princess Royal Harbour, King George's Sound.

309*b*. **obtusa,** var. **majuscula,** *Harv.;* fronde sanguinea crassiore elata (6–8 uncias longa) densissime composito-pinnata, ramis ramulisque brevibus creberrimis. *Laurencia,* Harv. Alg. Exsicc. n. 236.
HAB. On rocks. Rottnest Island, Western Australia. King George's Sound. Cape Shank, Bass's Straits, *Mrs. Barker.*

310. **arbuscula,** *Sond.* (J. Ag. Sp. Alg. ii. p. 769.)
HAB. Western Australia, *Preiss!* [Species valde dubia.]

311. **cruciata,** *Harv.;* livido-purpurea, cæspitosa; fronde terete rigida quoquoversum ramosa, ramis ramulisque patentissimis oppositis verticillatisve raro alternis, ramulis junioribus cylindraceis truncatis, fructiferis verrucoso-glandulosis. *Harv. in Trans. R. I. Acad.* xxii. *p.* 544.
HAB. On stems of *Cymodocea antarctica,* Rottnest, Western Australia. Twofold Bay, *Dr. Mueller.* [Known from *L. obtusa* by its colour and much greater rigidity, etc. It scarcely adheres to paper under pressure.]

*** *Fronde compressa v. complanata, distiche pinnata.*

312. **botryoides,** *Gaill.* (PLATE CLXXXII.)
HAB. South coast, from Port Fairy to Bass's Straits. Tasmania.

312*a*. **botryoides,** var. **minor;** fronde graciliori, ramulis brevioribus, corymboso-glandulosis. *L. papillosa,* Harv. Alg. Austr. Exsicc. n. 240, non Grev.

313. **elata,** *Harv.* (Ner. Austr. t. 33.)
HAB. West and south coasts of Australia. Tasmania. (New Zealand.)

313*a*. **elata,** var. **luxurians,** *Harv.;* ramis superioribus complanatis creberrime bi-tripinnatis, pinnulis latiusculis flaccidis roseis.
HAB. Fremantle, Western Australia, and King George's Sound. [Much more plumose than the ordinary form, of brighter colour and softer substance. But intermediate states connect this with the typical form, figured in Ner. Austr.]

314. **Grevilleana,** *Harv.* (PLATE XV.)
HAB. Reefs at Rottnest Island, Western Australia.

315. **distichophylla,** *J. Ag.* (J. Ag. (?) Sp. Alg. ii. p. 762.)
HAB. Western Australia, rare. (New Zealand.)

LXXX. LOMENTARIA, *Lyngbye.*

316. **zostericola,** *Harv.;* fronde pusilla (1–2-unciali) paniculatim ramosa ambitu ovata, caule basi inconspicue articulato supra toruloso, ramis ramulisque patentibus suboppositis v. verticillatis (nunc sparsis) obtusis articulato-constrictis, articulis diametro brevioribus v. subæqualibus, ceramidiis globosis sparsis v. aggregatis. *Harv. in Trans. R. I. Acad.* xxii. *p.* 545.
HAB. On leaves of *Zostera,* at Rottnest, Western Australia.

LXXXI. CHAMPIA, *Agardh.*

317. **Tasmanica,** *Harv.* (J. Ag. Sp. Alg. ii. p. 370.)
HAB. West and south coasts of Australia. Tasmania.

317*a*. **Tasmanica,** var. **gracilis,** *Harv.;* fronde multo graciliore flexuosa.
HAB. West and south coasts of Australia. Port Arthur, Tasmania.

318. **compressa,** *Harv.* (Ner. Austr. t. 30.)
HAB. Western Australia. Port Fairy, Victoria. (Cape of Good Hope. Ceylon. Tongataboo.)

319. **obsoleta,** *Harv.* (Fl. Tasm. p. 307.)
HAB. Port Fairy, Victoria. Tasmania. (New Zealand.)

320. **affinis,** *Harv.* (Ner. Austr. t. 29.)
HAB. West and south coasts, common. Tasmania. (New Zealand.)

321. **parvula,** *Harv.* (*Lomentaria parvula,* J. Ag. Sp. ii. p. 729.)
HAB. West, south, and east coasts. Tasmania. (New Zealand. Tongataboo, Friendly Islands. Red Sea [*L. irregularis,* Zan.]. East coast of North America. Atlantic and Mediterranean coasts of Europe.)

Family IX. WRANGELIACEÆ.

LXXXII. WRANGELIA, *Agardh.*

Sect. 1. NOBILES.—*Frons strato cellularum corticata.*

322. **Princeps,** *Harv.* (PLATE CCXXXIV.)
HAB. Western Australia, *G. Clifton.* South coast, *W. H. H.*

323. **plumosa,** *Harv.* (Fl. Tasm. ii. p. 308.)
HAB. Brighton, Port Philip, and Geelong. Tasmania.

324. **penicillata,** *Ag.* (J. Ag. Sp. Alg. ii. p. 708.)
HAB. Rottnest Island, Western Australia. (Mediterranean Sea. Keys of Florida.)

325. **nobilis,** *Harv.* (Fl. Tasm. ii. p. 308.)
HAB. Abundant in the Tamar, Tasmania. Sealer's Cove, *Dr. Mueller.*

326. **clavigera,** *Harv.* (PLATE CCLXXXVII.)
HAB. South coasts of Australia.

327. **abietina,** *Harv.;* fronde cartilaginea crassa elongata (6–10 uncias longa) corticata decomposite pinnata, pinnis pinnulisque alternis distichis subhorizontalibus, ultimis tenuiter corticatis vix inarticulatis, ad genicula verticillatim ramellosis, ramellis dichotomis incurvis obtusis, articulis diametro 3–4-plo longioribus. *Harv. in Trans. R. I. Acad.* xxii. *p.* 546.
HAB. Garden Island, Western Australia.

328. **Jeannerettii,** *Hook. f. and Harv.* (Fl. Tasm. ii. p. 308.)
HAB. Port Arthur, Tasmania.

329. **velutina,** *Harv.* (PLATE XLVI.)
HAB. Western Australia, abundant. Port Fairy and Port Philip.

330. **setigera,** *Harv.* (Fl. Tasm. ii. p. 309. t. 191. A.)
HAB. Port Philip. Georgetown, Tasmania.

Sect. 2. VERTICILLATÆ.—*Frons a basi pellucide articulata, ecorticata.*

331. **Halurus,** *Harv.* (PLATE LXX.)
HAB. Western and southern coasts.

332. **verticillata,** *Harv.;* fronde longe supra basin stuposa ecorticata gelatinoso-membranacea alterne ramosissima, ramis virgatis ramellis verticillatis, ramellis internodio sæpius brevioribus subpinnatim ramosis crassis obtusissimis mollissimis, articulis ramellorum diametro 4–8-plo longioribus, tetrasporis globosis ad ramellorum latera sessilibus. *Harv. Alg. Exsicc. n.* 260.
HAB. Port Fairy and Western Port. Warnamboul, *H. Watts,* 44.

333. **protensa,** *Harv.* (Fl. Tasm. ii. p. 308.)
HAB. Port Philip. Georgetown, Tasmania.

334. **crassa,** *Hook. f. and Harv.* (Fl. Tasm. ii. p. 308.)
HAB. Western Australia, *G. Clifton.* South Australia, *Dr. Curdie.* Warnamboul, *H. Watts.* Georgetown, Tasmania, *R. Gunn, W. H. H.* M'Donnell Bay, *Mrs. Wehl.*

335. **Wattsii,** *Harv.* (PLATE CCXXXIII.)
HAB. Warnamboul, *H. Watts.*

336. **nitella,** *Harv.* (PLATE CV.)
HAB. Western Australia.

337. **myriophylloides,** *Harv.* (PLATE CCXXIV.)
HAB. Western Australia. M'Donnell Bay, *Mrs. Wehl.*

338. **mucronata,** *Harv.* (Fl. Tasm. ii. p. 309. t. 191. B.)
HAB. Tasmania, *R. Gunn.* Warnamboul, *H. Watts.*

339 ? **tenella,** *Harv.;* pusilla (1½-uncialis), cæspitosa, fronde tenuissima membranacea a basi articulata ecorticata vage ramosa, ramis simpliciusculis nunc iterum ramosis elongatis virgatis per totam longitudinem bipinnatis, pinnis brevissimis (vix semilineam longis) oppositis v. verticillatis, pinnulis obtusis brevibus, articulisra morum diametro 4-plo, pinnarum 2–3-plo, pinnularum sesquilongioribus. *Harv. in Trans. R. I. Acad.* xxii. *p.* 346.
HAB. On the "Jetty" Reef, Rottnest Island, Western Australia.

Family X. CORALLINACEÆ.

LXXXIII. CORALLINA, *Lamouroux.*

340. **Cuvieri,** *Lamx.* (J. Ag. Sp. Alg. ii. p. 572.)
HAB. West, south, and east coasts, common. Tasmania. Norfolk Island. (New Zealand.) [Under this species are included *C. rosea,* Lamx. Ner. Austr. t. 40; *J. granifera,* Dcne. Ner. Austr. p. 106.]

340*a*. **Cuvieri,** var. **crispata,** *Aresch.* (J. Ag. l. c. p. 572.)
HAB. West, south, and east coasts. Tasmania. (New Zealand.)

341. **pilifera,** *Lamx.* (J. Ag. l. c. p. 571.)
HAB. Near Port Adelaide, *Herb. Sond.*

342. **officinalis,** *Lamx.* (J. Ag. l. c. p. 562.)
HAB. Brown's River, Tasmania, *R. Gunn.* (Atlantic and Pacific Oceans, north and south. Mediterranean and Black Seas.)

343. **chilensis,** *Dcne.* (J. Ag. l. c. p. 565.)
HAB. Norfolk Island, *Herb. T. C. D.* Sealer's Cove, *Dr. Mueller!* Twofold Bay, *Dr. Mueller.* (Coasts of Chile. Port Famine, Tierra del Fuego.)

344 ? **calliptera,** *Kütz.* (Kütz. Sp. Alg. p. 706.)

345 ? **plumifera,** *Kütz.* (Kütz. l. c. 705.)
(Both probably referable to *C. Cuvieri.*)

346 ? **nana,** *Lenorm.*; parasitica, nana, di-trichotoma, fastigiata, articulis cuneatis diametro subduplo longioribus.
HAB. Parasitical on various *Cystophoræ*. Port Fairy, *W. H. H. ! Alg. Austr. Exsicc. n.* 452. Port Philip, *Dr. Mueller ! in Herb. Lenorm.*

LXXXIV. JANIA, *Lamouroux.*

347. **micrarthrodia,** *Lamx.* (J. Ag. l. c. p. 555.)
HAB. West and south coasts, common. Norfolk Island. (New Zealand.)

348. **fastigiata,** *Harv.* (PLATE CCLI.)
HAB. Port Fairy, Victoria, rare, *W. H. H.* (Simon's Bay, *C. Wright;* and Algoa Bay, Cape of Good Hope.)

349. **affinis,** *Harv.;* fronde pusilla dichotoma, ramis ramulisque erectis strictiusculis, axillis acutis, articulis omnibus cylindraceis diametro 3–4-plo longioribus, ceramidiis parvis urnæformibus. *Harv. in Trans. R. I. Acad.* xxii. *p.* 547; *Harv. Alg. Austr. Exsicc. n.* 449.—*J. rubenti* valde affinis, vix diversa, nisi articulis subbrevioribus.
HAB. Rottnest Island, Western Australia.

350 ? **pedunculata,** *Lamx.* (J. Ag. l. c. p. 559.)

351 ? **compressa,** *Lamx.* (J. Ag. l. c. p. 559.)

LXXXV. ARTHROCARDIA, *Areschoug.*

352. **Wardii,** *Aresch.* (Harv. Ner. Austr. t. 38.)
HAB. South and east coasts of Australia. Tasmania.

353. **Mallardiæ,** *Aresch.* (Harv. l. c. p. 99.)

LXXXVI. CHEILOSPORUM, *Areschoug.*

354. **pulchellum,** *Harv.;* fronde pusilla brevi-stipitata dichotoma flabelliformi fastigiata, articulis sagittatis medio costatis sæpe transversim rugulosis diametro sesquilongioribus, lobis brevibus acutis erectis, ceramidiis . . . ? *Harv. in Trans. R. I. Acad.* xxii. *p.* 547; *Alg. Austr. Exsicc. n.* 446.
HAB. Rottnest Island, Western Australia.

355. **sagittatum,** *Aresch.* (PLATE CCL.)
HAB. Kiama, New South Wales. (Mauritius. Port Natal, South Africa. Algoa Bay.)

LXXXVII. AMPHIROA, *Lamouroux.*

356. **australis,** *Sond.* (PLATE LXXVII.)
HAB. Rottnest Island, Western Australia.

357. **galaxauroides,** *Sond.* (Pl. Preiss. ii. p. 188.)
HAB. Western Australia, *Preiss.* (*Harv. Alg. Austr. Exsicc. n.* 456 ??)

358. **anceps,** *Lamk.* (Ner. Austr. t. 37.)
HAB. Western Australia, *W. H. H.* Norfolk Island.

359. **Ephedræa,** *Lamk.* (J. Ag. Sp. Alg. ii. p. 534.)
HAB. Western Australia. Port Fairy, Victoria. Kiama and Newcastle, New South Wales. Twofold Bay, *Dr. Mueller !* (Cape of Good Hope.)

360. **gracilis,** *Harv.* (PLATE CCXXXI.)
HAB. Western Australia.

361. **charoides,** *Lamx.* (Ner. Austr. t. 39.)
HAB. West and south coasts, common. Tasmania.

362. **granifera,** *Harv.;* fronde di-trichotoma fastigiata, articulis cylindraceis, inferioribus basi et apice nodoso-incrassatis, superioribus simplicibus diametro 6–8-plo longioribus, geniculis diametro æqualibus, inferioribus calcareo-granulosis, superioribus nudis, ceramidiis ad ramulos secundis. *Harv. Alg. Exsicc. n.* 460.
HAB. Cape Riche, Western Australia. Port Fairy, Victoria.

363. **intermedia,** *Harv.;* fronde gracili fastigiata subtetrachotoma, ramulis stellatim patentibus verticillatis, articulis cylindraceis basi et apice nodoso-incrassatis, superioribus diametro 8-plo longioribus, geniculis angustissimis, ceramidiis ad ramulos secundis. *Harv. Alg. Exsicc. n.* 457.

364. **stelligera,** *Lamk.* (PLATE CCXXX.)
HAB. West and south coasts, common. Tasmania.

365 ? **nobilis,** *Kütz.* (Kütz. Sp. Alg. p. 703.)

366. **Tasmanica,** *Sond.* (Sond. in Linn. xxv. p. 686.)
HAB. Tasmania, *Stuart.*

LXXXVIII. **MASTOPHORA,** *Decaisne.*

367. **Lamourouxii,** *Dcne.* (Ner. Austr. t. 41.)
HAB. West and south coasts, common. (Under this is included *M. flabellata,* Sond. Cape of Good Hope. Java.)

368. **plana,** *Sond.* (J. Ag. Sp. Alg. ii. p. 527.)
HAB. Western Australia.

369. **canaliculata,** *Harv.* (PLATE CCLXIII.)
HAB. Port Fairy, *W. H. H.* Tasmania, *C. Stuart.*

LXXXIX. **LITHOTHAMNION,** *Philippi.*

370. **Darwini,** *Aresch.* (J. Ag. ii. p. 523.)
HAB. King George's Sound, *C. Darwin.* (The Australian species of *Lithothamnion* have yet to be collected and examined.)

XC. **MELOBESIA,** *Lamouroux.*

371. **lichenoides,** *Ellis.* (J. Ag. Sp. Alg. ii. p. 515.)
HAB. Norfolk Island, *Dr. M'William.* (Atlantic and Mediterranean.)

372. **Patena,** *Hook. f. and Harv.* (Ner. Austr. t. 40.)
HAB. Parasitical on *Ballia callitricha,* common. (New Zealand.)

373. **pustulata,** *Lamx.* (J. Ag. l. c. p. 513.)
HAB. Norfolk Island, *Dr. M'William.* (Atlantic and Mediterranean.)

374. **farinosa,** *Lamx.* (J. Ag. l. c. p. 512.)
HAB. Parasitical on various Algæ. (Atlantic and Mediterranean.)

375. **membranacea,** *Lamx.* (J. Ag. l. c. p. 512.)
HAB. Parasitical on *Zostera,* etc. (Cosmopolitan. The species of *Melobesia* have been generally neglected by Australian collectors.)

Family XI. SPHÆROCOCCOIDEÆ.

XCI. **CHAUVINIA,** *Harvey* (not of Bory).

376. **coriifolia,** *Harv.* (*Delesseria coriifolia;* PLATE CI.)
HAB. Swan River, *W. H. H., C. Clifton.* M'Donnell Bay, *Rev. J. E. Wood, Mrs. Wehl!*

377. **imbricata,** *Harv.* (PLATE CCXL.)
HAB. Port Philip Heads. Western Port.

XCII. **DELESSERIA,** *Lamouroux.*

378. **Lyallii,** *Hook. f. and Harv.* (Fl. Antarct. ii. t. 176; Fl. Tasm. ii. p. 311.)
HAB. In the Tamar, Tasmania. Port Jackson, New South Wales. (Falkland Islands and Kerguelen's Land.)

379. **Tasmanica,** *F. Muell.* (Fl. Tasm. t. 190.)
HAB. Georgetown, Tasmania.

380. **ruscifolia,** *Ag.* (Harv. Phyc. Brit. t. 26.)
HAB. Western Australia, *G. Clifton!* (Cape of Good Hope, *W. H. H.* New Zealand, *Lyall!* Europe.)

381. **serrulata,** *Harv.* (PLATE LIX.)
HAB. Paramatta River, Port Jackson, *C. Moore.* (Japan.)

382. **dendroides,** *Harv.* (PLATE CXXXVII.)
HAB. Fremantle, Western Australia.

383. **hypoglossoides,** *Harv.* (PLATE LXXXVII.)
HAB. Rottnest Island, Western Australia. Port Jackson, New South Wales.

384. **Hypoglossum,** *Ag.* (Harv. Phyc. Brit. t. 2.)
HAB. Tasmania, *Herb. Dnæ. Woolhouse!* (Europe. Canary Islands. South Carolina, United States.)

385. **revoluta,** *Harv.* (PLATE CLXX.)
HAB. Fremantle, and King George's Sound, Western Australia. M'Donnell Bay, *Mrs. Wehl!*

386. **frondosa,** *Harv.* (PLATE CLXXIX.)
HAB. West coast, rare. Common on the south coasts of New Holland, and in Tasmania. [Very variable in the proportionate breadth of the frond, etc.]

387. **endiviæfolia,** *Harv.* (Ag. Sp. Alg. ii. p. 697.)
HAB. South coast, from Port Fairy to Western Port. Tasmania.

388. **denticulata,** *Harv.* (PLATE CCXLIV.)
HAB. Rottnest Island, Western Australia.

389. **spathulata,** *Sond.* (J. Ag. Sp. Alg. ii. p. 698.)
HAB. Western Australia, *Preiss, G. Clifton.* King George's Sound. *W. H. H.*

390. **crispatula,** *Harv.* (PLATE CCLXVIII.)
HAB. Fremantle, Western Australia, on stems of *Cymodocea antarctica.*

391. **Leprieurii,** *Mont.* (J. Ag. Sp. Alg. ii. p. 682.)
HAB. In the river Yarra, *Dr. Mueller,* and in the Moyne, Port Fairy. Tidal rocks, near high-water mark, Port Dalrymple, Tasmania. (Cayenne, French Guiana! In the Hudson river, at West Point, New York State, *Professor J. W. Bailey!* New Zealand.)

XCIII. **NITOPHYLLUM,** *Greville.*

392. **erosum,** *Harv.* (PLATE XCIV.)
HAB. West and south coasts of New Holland. M'Donnell Bay, *Mrs. Wehl.*

393. **stipitatum,** *Harv.* (Fl. Tasm. ii. p. 312.)
HAB. East coast of Tasmania, *R. Gunn.*

394. **crispum,** *Kütz.* (J. Ag. Sp. Alg. ii. p. 662.)
HAB. South coast of New Holland. Tasmania. [The largest and most delicately membranous of the Australian species; so closely resembling *N. punctatum*, of the northern hemisphere, that I fear it can hardly be justly regarded as other than an austral variety of that plant.]

395. **Gunnianum,** *Harv.* (PLATE CCXLI.)
HAB. South coast of New Holland. Tasmania.

396. **Curdieanum,** *Harv.* (PLATE CLI.)
HAB. Glenelg river, *Dr. Curdie.* Armstrong Bay, Port Fairy, *W. H. H.* M'Donnell Bay, *Rev. J. E. Wood.*

397. **affine,** *Harv.* (Ag. Sp. Alg. ii. p. 657.)
HAB. South coast of New Holland. Tasmania.

398. **multipartitum,** *Hook. f. and Harv.* (J. Ag. Sp. Alg. ii. p. 664.)
HAB. Tasmania.

399. **pristoideum,** *Harv.* (PLATE CCXXIX.)
HAB. South coasts of Australia. M'Donnell Bay, *Mrs. Wehl.*

400. **cartilagineum,** *Harv.;* fronde sessili avenia cartilagineo-membranacea rigida crassa dichotoma, laciniis linearibus pluries divisis crispato-undulatis obtusis patentibus, axillis rotundatis, soris minutis impressis per totam frondem sparsis. *Harv. in Trans. R. I. Acad.* xxii. p. 549.
HAB. Garden Island, Western Australia, *W. H. H.* Fremantle, *G. Clifton.*

401. **pulchellum,** *Harv.;* pusillum (subbiunciale), tenuissime membranaceum, roseum, cæspitosum, fronde sessili avenia dichotoma fastigiata, laciniis lato-linearibus v. cuneatis undulato-crispatis patentibus obtusis, axillis obtusis, soris rotundatis majusculis per totam frondem sparsis. *Harv. in Trans. R. I. Acad.* xxii. p. 549.
HAB. King George's Sound, and Rottnest Island, Western Australia.

402. **minus,** *Sond.* (J. Ag. Sp. Alg. ii. p. 655.)
HAB. Fremantle and Garden Island, Western Australia.

403. **ciliolatum,** *Harv.;* fronde cæspitosa sessili angusti-lineari dichotoma ramosissima ciliolis marginalibus et superficialibus passim echinulata. *Harv. in Trans. R. I. Acad.* xxii. p. 549.

404. **monanthos,** *J. Ag.* (J. Ag. Sp. Alg. ii. p. 655.)
HAB. Parasitic on various Algæ. Port Fairy, *W. H. H.*

405. **uncinatum,** *J. Ag?* (J. Ag. l. c. p. 654.)
HAB. Port Fairy, *W. H. H.* Twofold Bay, *Dr. Mueller.* (New Zealand. Atlantic and Mediterranean coasts of Europe?)

XCIV. PHACELOCARPUS, *Endlicher.*

406. **Labillardieri,** *Endl.* (PLATE CLXIII.)
HAB. West and south shores of New Holland. Tasmania. (New Zealand.)

406*a*. **Labillardieri,** var. **intermedius,** *Harv.;* ramis obsolete costatis, costa anguste alata.
HAB. With the preceding, and equally common.

406*b*. **Labillardieri,** var. **macer,** *Harv.;* omnibus partibus tenuior, pinnulis angustissime subulatis.
HAB. With the preceding; not rare.

407. **alatus,** *Harv.;* fronde costata, costa valida crassa bene definita utroque latere alata, pinnulis subulatis distichis. *Harv. in Trans. R. I. Acad.* xxii. *p.* 549.
HAB. Rottnest Island, Western Australia, *W. H. H.* Port Philip Heads, *Mr. Rawlinson.*

408. **complanatus,** *Harv.* (PLATE CCLII.)
HAB. South Australia, *Dr. Curdie!* Port Fairy, *W. H. H.* Warnamboul, *H. Watts!* South Port, Tasmania, *C. Stuart.* M'Donnell Bay, *Mrs. Wehl.*

XCV. HERINGIA, *J. Agardh.*

409. **furcata,** *Harv.* (PLATE CCXV.)
HAB. Glenelg river, *Dr. Curdie.* Warnamboul, *H. Watts.* Port Philip Heads, *W. H. H.*

410. **filiformis,** *Harv.;* fronde cæspitosa e surculis repentibus orta setacea filiformi v. apice compressa vage ramosa subdichotoma rigidiuscula. *Harv. in Trans. R. I. Acad.* xxii. *p.* 549.
HAB. Garden Island, Western Australia, rare, *W. H. H.* (*n.* 312).

XCVI. LECITHITES, *J. Agardh.*

411. **rangiferinus,** *J. Ag.* (Sp. Alg. ii. p. 636.)
HAB. Kent Islands, *R. Brown.* (*Turn. Hist. t.* 183.)

XCVII. DICURELLA, *Harvey.*

412. **concinna,** *J. Ag.* (Sp. Alg. ii. p. 631.)
HAB. Kent Islands, *R. Brown.* (*Turn. Hist. t.* 153.) [Turner's description agrees well with *Melanthalia obtusata, β, intermedia.*]

XCVIII. CALLIBLEPHARIS, *Kützing.*

413. **conspersa,** *Harv.* (PLATE CCXXXVII.)
HAB. West and south coasts of New Holland.

414. **Preissiana,** *J. Ag.* (PLATE CVI.)
HAB. Fremantle and King George's Sound, Western Australia, abundant.

415. **ramentacea,** *J. Ag.* (Sp. Alg. ii. p. 621.)
HAB. South coast of New Holland, *Herb. Agardh.* [Is not this rather a *Rhodophyllis?*]

XCIX. THYSANOCLADIA, *Endlicher.*

416. **dorsifera,** *Endl.* (J. Ag. Sp. Alg. ii. p. 616.)
HAB. Coast of New Holland *Herb. Paris!* (*Ner. Austr. t.* 35.)

417. **costata,** *Harv.;* fronde plana, costa valida bene definita percursa distiche decomposito-pinnata ambitu ovata, pinnis patentibus approximatis suboppositis costatis, pinnulis argute serratis subcostatis, coccidiis?, *Harv. in Trans. R. I. Acad.* xxii. p. 550; *Alg. Exsicc. Austr. n.* 308.
HAB. Rottnest Island, Western Australia, *W. H. H.* [Possibly this is only a more strongly ribbed variety of *T. dorsifera?*]

418. **coriacea,** *Harv.* (Ner. Austr. t. 36.)
HAB. Western Australia, very common at Rottnest and Garden Islands.

419. **laxa,** *Sond.* (PLATE CCXI.)
HAB. West and south coasts of New Holland, rare.

420. **oppositifolia,** *J. Ag.* (PLATE CLXXXVII.)
HAB. Common at Garden and Rottnest Islands, Western Australia.

C. **MELANTHALIA,** *Montagne.*

421. **obtusata,** *Mont.* (PLATE XXV.)
HAB. South coast of New Holland. Tasmania.

421*a*. **obtusata,** var. **intermedia,** *Harv.* (PLATE XXV. f. 2.)
HAB. With the preceding. [This seems to be *Fucus concinnus*, R. Br. in Turn. Hist. t. 153. It is also *M. Jaubertiana*, of Sond. in Linn. xxv. p. 689, excl. syn.]

CI. **CURDIEA,** *Harvey.*

422. **laciniata,** *Harv.* (PLATE XXXIX.)
HAB. South coast of New Holland, from Cape Northumberland, eastward to Bass's Straits. [This is *Gracilaria calophyllis*, Aresch.]

423. **obtusata,** *Harv.* (PLATE CCX.)
HAB. Western Australia, common. Port Philip Heads and Western Port.

CII. **SARCOCLADIA,** *Harvey.*

424. **obesa,** *Harv.* (Harv. in Trans. R. I. Acad. xxii. p. 550.)
HAB. West coast and King George's Sound.

CIII. **GRACILARIA,** *Grevilla.*

425. **dactyloides,** *Sond.* (PLATE LXXX.)
HAB. Western Australia, common.

426 ? **Gracilaria ?** sp. (Harv. Alg. Austr. Exsicc. n. 324; W. Austr. n. 203.)
HAB. King George's Sound. (Not satisfactorily determined. It resembles some forms of *Gymnogongrus furcellatus*, but has the structure of *Gracilaria*. No fruit seen.)

427. **fruticosa,** *Harv.*; fronde rubro-coccinea siccitate fuscescente compressa quoquoversum ramosa, ramis crebris patentissimis bis terve divisis, ramulis alternis v. secundis vage spinoso-armatis acutis, coccidiis? *Harv. in Trans. R. I. Acad.* xxii. *p.* 551.
HAB. Fremantle, Western Australia, rare, *W. H. H.* (*n.* 222).

428. **confervoides,** *Grev.* (Ag. Sp. Alg. ii. p. 587.)
HAB. West and south coasts of New Holland, Tasmania. (Atlantic Ocean, north and south. Indian Ocean. Chinese Sea. New Zealand, etc., almost cosmopolitan.)

429. **furcellata,** *Mont.* (PLATE CCLXXXVI.)
HAB. Western Australia. (Red Sea).

430. **Ramalina,** *Harv.* (PLATE CCLX.)
HAB. King George's Sound.

431. **corniculata,** *J. Ag.* (Sp. Alg. ii. p. 595. *Fucus corniculatus*, Turn. Hist. t. 182.)
HAB. New Holland, *R. Brown.* Port Philip, *Malm.* (I am not acquainted with this. By Agardh's description, it may be perhaps the same as our *Acanthococcus Ewingii.*)

432. (**Ceramianthemum**) **secundata**, *Harv.*; fronde cartilaginea terete rubropurpurea ramosissima, ramis ramulisque sæpius secundis longissimis simplicibus attenuatis, ceramidiis ovato-globosis numerosissimis. *Harv. Alg. Exsicc. Austr. n.* 325.
HAB. Kiama, New South Wales, on rocks at low water, *W. H. H.*, 1–2 feet long, in dense tufts. The external stratum of the frond is very broad.

CIV. **CORALLOPSIS**, *Greville.*

433. **australasica**, *Sond.* (Sond. in Linn. xxv. p. 687.)
HAB. Encounter Bay and Wilson's Promontory, *Dr. Mueller.* (Unknown to me.)

Family XII. GELIDIACEÆ.

CV. **GELIDIUM**, *Lamouroux.*

434. **proliferum**, *Harv.* (PLATE CCIV.)
HAB. Fremantle, Western Australia.

435. **glandulæfolium**, *Hook. f. and Harv.* (PLATE XVIII.)
HAB. South coast of New Holland. Tasmania.

436. **asperum**, *Grev.* (J. Ag. Sp. Alg. ii. p. 475.)
HAB. South coast of New Holland. Tasmania. (New Zealand, *J. Ag.*)

437. **corneum**, *Lamx.* (J. Ag. Sp. Alg. ii. p. 469.)
HAB. Coasts of New Holland and Tasmania. (North and south Atlantic and Pacific. Indian Ocean. Chinese Sea. New Zealand. Nearly cosmopolitan, and very variable in size and ramification.)

437*a*. **corneum**, var. **ramellosum**. (J. Ag. Sp. Alg. ii. p. 477. *Acrocarpus ramellosus*, Kütz. Phyc. Gen. p. 405.)
HAB. Abundant at Fremantle, Western Australia, on rocks, near high-water mark.

CVI. **PTEROCLADIA**, *J. Agardh.*

438. **lucida**, *J. Ag.* (PLATE CCXLVIII.)
HAB. West and south-west coasts of New Holland. (New Zealand.)

CVII. **NIZYMENIA**, *Sonder.*

439. **australis**, *Sond.* (PLATE CLXV.)
HAB. Port Philip Heads. Cape Shank, *Mrs. Barker!* Tasmania.

CVIII. **CHÆTANGIUM**, *Kützing.*

440. **flabellulatum**, *Harv.* (Fl. Tasm. ii. p. 316.)
HAB. Port Arthur, Tasmania.

441. **Lingula**, *Harv.* (Fl. Tasm. ii. p. 316.)
HAB. Brown's River, Tasmania, *R. Gunn!*

CIX. **BINDERA**, *Harvey.*

442. **splachnoides**, *Harv.* (PLATE CXI.)
HAB. Western Australia, *G. Clifton!*

CX. **HENNEDYA**, *Harvey.*

443. **crispa**, *Harv.* (PLATE LXXV.)
HAB. Western Australia, abundantly.

CXI. ACROTYLUS, *J. Agardh.*

444. **australis,** *J. Ag.* (PLATE XCIX.)
HAB. South coast of New Holland. Tasmania.

CXII. SOLIERIA, *J. Agardh.*

445. **australis,** *Harv.* (PLATE CXLIX.)
HAB. Western Australia. Tasmania.

446. **chordalis,** *J. Ag.* (J. Ag. Sp. Alg. ii. p. 723.)
HAB. Port Jackson, New South Wales, *C. Moore.*

CXIII. DICRANEMA, *Sonder.*

447. **filiforme,** *Sond.* (J. Ag. Sp. Alg. ii. p. 634.)
HAB. Fremantle, Western Australia.

448. **Grevillei,** *Sond.* (PLATE CXX.)
HAB. West and south coasts of New Holland. Flinders Island, *Dr. Milligan!*

449. **revolutum,** *J. Ag.* (PLATE LXXIV.)
HAB. Cape Riche, *W. H. H.* Port Philip Heads, *Dr. Mueller.*

450? **furcellatum,** *Hook. f. and Harv.* (Fl. Tasm. ii. p. 313.)
HAB. Port Arthur, Tasmania.

CXIV. HYPNEA, *Lamouroux.*

451. **episcopalis,** *Hook. f. and Harv.* (PLATE XXIII.)
HAB. West and south coasts of New Holland. Tasmania.

452. **musciformis,** *J. Ag.* (Sp. Alg. ii. p. 442.)
HAB. Swan River. King George's Sound.

453. **seticulosa,** *J. Ag.* (Sp. Alg. ii. p. 446.)
HAB. West and south coasts of New Holland. Tasmania. (Friendly Islands. Loochoo Islands. Hongkong.)

454. **divaricata,** *Grev.* (J. Ag. Sp. Alg. ii. p. 448.)
HAB. Western Australia, *Preiss.* Holdfast Bay, *Mueller.* (Mauritius. Oahu, *Wilkes!* Gulf of Mexico, *Liebmann.*)

455. **Cenomyce,** *J. Ag.* (Sp. Alg. ii. p. 452.)
HAB. Coasts of New Holland. Holdfast Bay, *Mueller.*

456. **rigens,** *Sond.*; "elata, virgato-ramosissima, ramis elongatis, ramulis abbreviatis subulatis, inferioribus sæpe nudis apice incrassato-circinatis, reliquis omnibus ramellos fructiferos undique egredientes gerentibus, sporiferis erectis simplicibus siliquæformibus lanceolatis rostratis basi attenuata sterili pedicellatis, capsuliferis spinescentibus simplicibus ramosisve patentibus." *Sond. in Linn.* xxv. p. 684.
HAB. Holdfast Bay, *Dr. Mueller.* [Is this different from *H. episcopalis?*]

457. **fastigiata,** *Harv.*; frondibus sterilibus cæspitosis fastigiatis ramosissimis, ramis liberis dichotomo-multifidis ultra-setaceis, ramulis sparsis subulatis patentibus, fertilibus . . . *Harv. Alg. Exsicc. Austr. n.* 343.
HAB. Port Philip Heads, *W. H. H.* Western Port, *Dr. Mueller.* [Can this be *Gracil. corniculata*, J. Ag.?]

458. **cystoclonioides,** *Sond.* (Sond. in Linn. xxvi. p. 519.)
HAB. Wilson's Promontory, *Dr. Mueller.* (Said to differ from *H. rigens* in being less rigid, with more patent and slender ramuli; those bearing

tetraspores produced into a long beak, which also bears tetraspores near its summit.)

CXV. **ACANTHOCOCCUS**, *Hook. f. and Harvey.*

459. **Ewingii**, *Harv.* (PLATE CXLI.)
HAB. South coast of New Holland. Tasmania.

460. **acicularis**, *J. Ag.* (J. Ag. Sp. Alg. ii. p. 437.)
HAB. West coasts of New Holland.

461. **pusillus**, *Harv.* (PLATE CLXVI.)
HAB. South coast.

462? **obtusangulus**, *Harv.*; fronde compressa decomposito-dichotoma, ramulis lateralibus nullis, axillis omnibus obtusis rotundatisve apicibus attenuatis, fructu ignoto (structura frondis ac in genere).
HAB. Twofold Bay, *Dr. Mueller.*

463? **gracilaria**, *Sond.* (Sond. in Linn. xxv. p. 683.)
HAB. Lefebre Peninsula, *Dr. Mueller.*

CXVI. **EUCHEUMA**, *J. Agardh.*

464. **speciosum**, *J. Ag.* (PLATE LXIV.)
HAB. Western Australia.

CXVII. **THAMNOCLONIUM**, *Kützing.*

465. **flabelliforme**, *Sond.* (PLATE CXIII.)
HAB. Western Australia.

466. **Lemannianum**, *Harv.* (PLATE CXIV.)
HAB. Western Australia.

467. **proliferum**, *Sond.* (Pl. Preiss. ii. p. 186.)
HAB. Western Australia.

468. **hirsutum**, *Kütz.* (PLATE CCXCIII.)
HAB. South coasts of New Holland. Tasmania.

Family XIII. SQUAMARIEÆ.

CXVIII. **PEYSSONNELIA**, *Decaisne.*

469. **australis**, *Sond.* (PLATE LXXXI.)
HAB. South coast of New Holland. Tasmania.

470. **Novæ-Hollandiæ**, *Kütz.* (Kütz. Sp. Alg. p. 693.)
HAB. South Australia, *Dr. Curdie.*

471. **multifida**, *Harv.* (PLATE CCLXIX.)
HAB. Newcastle, New South Wales.

472. **rubra**, *Grev.* (J. Ag. Sp. Alg. ii. p. 502.)
HAB. South Australia, *Dr. Curdie!* Port Jackson, *W. H. H.* Georgetown, Tasmania, *R. Gunn.* (Mediterranean Sea. Coral reef at Tongataboo, *W. H. H.* Ceylon, *W. H. H.*)

CXIX. **HÆMATOCELIS**, *J. Agardh.*

473. **australis**, *J. Ag.* (Sp. Alg. ii. p. 499.)
HAB. Shores of New Holland, *Sieber.*

CXX. RHODOPELTIS, *Harvey.*

474. **australis,** *Harv.* (PLATE CCLXIV.)
HAB. Parasitical on *Amphiroa australis*, in Western Australia, *W. H. H.*

Family XIV. HELMINTHOCLADIEÆ.

CXXI. LIAGORA, *Lamouroux.*

475. **Cheyneana,** *Harv.* (PLATE CLXII.)
HAB. Cape Riche, *W. H. H.* Fremantle, Western Australia, *G. Clifton.*

476. **distenta,** *Ag.* (J. Ag. Sp. Alg. ii. p. 426.)
HAB. Cape Riche, *W. H. H.* Southern Australia, *Dr. Curdie!* (Mediterranean and Adriatic Seas. Madeira. Loo-choo Islands, *C. Wright!*)

477. **viscida,** *Ag.* (J. Ag. Sp. Alg. ii. p. 425.)
HAB. King George's Sound and Cape Riche, *W. H. H.* Corio Bay, *Mr. Hannaford!* Georgetown, Tasmania, *W. H. H.* (Mediterranean and Adriatic Seas. West Indies. Azores. Indian Ocean. Red Sea.)

478. **pulverulenta,** *J. Ag.* (J. Ag. Sp. Alg. ii. p. 427.)
HAB. On rocks, South Bay, Fremantle, *Geo. Clifton!* (West Indies and Gulf of Mexico. Loo-choo Islands, *C. Wright!*)

479. **australasica,** *Sond.* (Sond. in Pl. Preiss. ii. p. 153.)
HAB. Western Australia, *Preiss.*

CXXII. GALAXAURA, *Lamouroux.*

480. **obtusata,** *Lamx.* (PLATE CCXXVIII.)
HAB. Western Australia, *G. Clifton!* Tasmania, *Herb. Greville.* (Tropical and subtropical oceans.)

481. **fragilis,** *Lamx.* (Kütz. Sp. Alg. p. 530.)
HAB. Norfolk Island, *Dr. M'William!* [Dr. M'William's specimens, in Herb. T. C. D., agree with what I have received from *Chauvin* under the name "*G. dichotoma*," Lamx.; from *Decaisne*, as "*G. fragilis;*" and from *Areschoug* as "*G. cylindrica*," Lamx.—I know not which of these names to adopt. The supposed species of this genus require careful revision.] (Tropical seas generallly.)

482. **(Microthoe) marginata,** *Lamx.* (PLATE CXXXVI.)
HAB. Western Australia. King George's Sound. Newcastle, New South Wales. (Tropical oceans. Port Natal. Rio Janeiro. Japan. Melanesia.)

483. **(Microthoe) lapidescens,** *Lamx.* (Kütz. Sp. Alg. p. 530.)
HAB. Rottnest Island, *W. H. H.* Garden Island, *G. Clifton!* (Tropical ocean. Canary Islands. Madagascar. Red Sea.)

484. **(Microthoe) Cliftoni,** *Harv.* (PLATE CCLXXV.)
HAB. Fremantle, Western Australia.

CXXIII. SCINAIA, *Birona.*

485. **furcellata,** *Biv.* (J. Ag. Sp. Alg. ii. p. 422.)
HAB. Swan River, *G. Clifton!* Western Port, *W. H. H.* Tasmania, *Gunn!* (Atlantic and Mediterranean coasts of Europe. Newport, Rhode Island, *Bailey!* Key West, Florida. Cape of Good Hope. New Zealand. Chile. Sandwich Islands.)

CXXIV. HELMINTHORA, *J. Agardh.*

486. **divaricata,** *J. Ag.* (J. Ag. Sp. Alg. ii. p. 416.)

HAB. Western Australia, at Rottnest Island, common. Port Philip. (Atlantic and Mediterranean coasts of Europe. Adriatic Sea, *Zanardini!* (*Nemalion ramosissimum*, Zan. !) Key West, Florida.)

CXXV. HELMINTHOCLADIA, *J. Agardh.*

487. **australis**, *Harv.* (PLATE CCLXXII.)
HAB. Western Australia, *G. Clifton!*

CXXVI. NEMALION, *Duby.*

488. **insigne**, *Harv.* (PLATE CCLXXXIV.)
HAB. Tasmania, in the Tamar, near Georgetown.

Family XV. RHODYMENIACEÆ.

CXXVII. HYMENOCLADIA, *J. Agardh.*

489. **Usnea**, *J. Ag.* (PLATE CXVIII.)
HAB. Port Philip Heads and Western Port, common. Flinders Island.

490. **divaricata**, *Harv.* (PLATE XX.)
HAB. King George's Sound.

CXXVIII. PLOCAMIUM, *J. Agardh.*

491. **procerum**, *J. Ag.* (PLATE CCXXIII.)
HAB. West and south coasts of New Holland. Tasmania.

491*a*. **procerum, β. Mertensii.** (*Pl. Mertensii*, J. Ag. Sp. Alg. ii. p. 401.)
HAB. West and south coasts of New Holland. Tasmania.

491*b*. **procerum, γ. nidificum**, *Harv.* (Ut supra.)
HAB. West and south coasts of New Holland.

492. **angustum**, *J. Ag.* (Sp. Alg. ii. p. 402.)
HAB. West, south, and east coasts of New Holland. Tasmania. (New Zealand.)

492*a*. **angustum, β. pusillum**, *Harv.* (*Pl. pusillum*, Sond. Pl. Preiss. ii. p. 192.)
HAB. Western Australia, *Preiss! G. Clifton.* (Dwarfer, more flexuous and bushy than the normal form, into which however it seems to pass by insensible gradations. Mr. Clifton has supplied me with many specimens.)

493. **costatum**, *J. Ag.* (Sp. Alg. ii. p. 403.)
HAB. West and south coasts of New Holland. Tasmania. (New Zealand.)

494. **Preissianum**, *Sond.* (PLATE LXIII.)
HAB. West and south coasts of New Holland.

495. **coccineum**, *Lyngb.* (J. Ag. Sp. Alg. ii. p. 395.)
HAB. West and south coasts of New Holland. Tasmania. (Atlantic coasts of Europe and America. North-west coast of America. Cape of Good Hope. Antarctic lands and islands. New Zealand.)

CXXIX. STENOGRAMME, *Harvey.*

496. **interrupta**, *Mont.* (PLATE CCXX.)
HAB. Lady Bay, Victoria, *Mr. Hannaford!* Georgetown and Port Arthur, Tasmania. (New Zealand. California. Keys of Florida. Atlantic and Mediterranean shores of Europe. Coasts of England and Ireland, rare.)

CXXX. RHODOPHYLLIS, *Kützing.*

497. **Gunnii,** *Harv.* (*Cladhymenia ? Gunnii,* Ner. Austr. t. 32.)
HAB. South coasts of New Holland. Tasmania. (New Zealand.)

498. **membranacea,** *Harv.* (Fl. Nov. Zeal. t. 117.)
HAB. West and south coasts of New Holland. Tasmania. (Excessively variable in size and ramification.) (New Zealand.)

499. **volans,** *Harv.* (PLATE CCXVI.)
HAB. Fremantle and King George's Sound, Western Australia.

500. **bifida,** *Kütz.* (J. Ag. Sp. Alg. ii. p. 388.)
HAB. Fremantle and King George's Sound. (Atlantic and Mediterranean coasts of Europe. Pacific Ocean, *sec. Montagne.*)

501. **blepharicarpa,** *Harv.* (PLATE CCLIV.)
HAB. Fremantle, Western Australia.

502. **multipartita,** *Harv.* (Fl. Tasm. ii. p. 318.)
HAB. South coast of New Holland. Tasmania.

503. **hypneoides,** *Harv.* (PLATE CXCIX.)
HAB. Port Philip Heads and Western Port. Tasmania.

504. **Barkeriæ,** *Harv.* (PLATE CCLXXVI.)
HAB. Cape Shank, *Mrs. Barker !* Western Port.

505. **nitophylloides,** *Harv.* (PLATE CCLVIII.)
HAB. Garden Island, Western Australia.

506. **Dictyopsis,** *Harv.* (*Dictyopsis fimbriata,* Sond. in Linn. xxvi. p. 519.)
HAB. Wilson's Promontory, *Dr. Mueller.* (Unknown to me. Possibly one of the innumerable forms of *R. membranacea ?*)

CXXXI. RHODYMENIA, *Greville.*

507. **australis,** *Sond.* (PLATE CXLVI. *Acropeltis australis,* J. Ag.)
HAB. Western Australia, common. Warnamboul. *H. Watts !* Port Philip Heads, *Dr. Mueller !*

508. **foliifera,** *Harv.*; fronde breviter stipitata rosea decomposito-dichotoma flabelliformi membranacea, laciniis anguste cuneatis linearibusve, cystocarpiis sæpissime in folia propria marginalia pusilla immersis, nunc per frondem sparsis, tetrasporis infra apicem segmentorum sorum rotundatum formantibus. *R. corallina (?)* Harv. Alg. Austr. Exsicc. n. 381 (non Bory).
HAB. West and south coasts of Australia. Tasmania. (Near *R. Palmetta,* but remarkably different when in fruit.)

509. **cuneata,** *Harv.* (PLATE CCXCV.)
HAB. East coast of Tasmania, *Gunn !*

510. **polymorpha,** *Harv.* (PLATE CLVII.)
HAB. Port Philip Heads and Western Port. Tasmania. Western Australia, rare, *G. Clifton !*

CXXXII. RHABDONIA, *Harvey.*

511. **globifera,** *J. Ag.* (PLATE CXXIX.)
HAB. Western Australia, rare, *G. Clifton !*

512. **dendroides,** *Harv.* (PLATE CLII.)
HAB. Cape Shank, *Mrs. Barker !* Western Port, *W. H. H.*

513. **coccinea,** *Harv.* (PLATE LIV.)
HAB. Western Australia, rare, *G. Clifton !* Port Philip. Tasmania.

514. **nigrescens,** *Hook. f. and Harv.* (Fl. Tasm. ii. p. 321.)
HAB. South coast of New Holland. Tasmania.

515. **verticillata,** *Harv.* (PLATE CCXCIX.)
HAB. South coasts of New Holland and Tasmania, common. (This is *Erythroclonium Muelleri*, Harv. in Fl. Tasm. ii. p. 322, excl. syn.)

516. **charoides,** *Harv.* (PLATE CXCVI.)
HAB. Port Philip Heads and Western Port.

517. **robusta,** *J. Ag.* (Sp. Alg. ii. p. 355.)
HAB. New Holland, *Frazer*. Port Philip, *Mr. Rawlinson!* Lefebre Peninsula, *Dr. Mueller!* Western Port, *Dr. Mueller*, 1847.

518. **mollis,** *Harv.*; fronde rubescente molliter succulenta membranacea crassiuscula dendroidea, caule subindiviso basi nuda sursum crebre ramosa, ramis alternis patentibus sæpius ramuliferis basi insigniter constrictis apice obtusis, ramulis omnino similibus. Chartæ arcte adhæret. *Harv. Alg. Austr. Exsicc. n.* 388.
HAB. Western Port, *W. H. H.* Port Philip, *Mr. Rawlinson.*

519. **patens,** *Harv.*; fronde rubescente rigidiuscula alterne ramosa, ramis subdistichis horizontaliter patentibus basi vix constrictis simplicibus nudis v. ramulos parvos perpaucos ferentibus apicibus obtusiusculis.
HAB. Garden Island, Western Australia, *G. Clifton!*

CXXXIII. ERYTHROCLONIUM, *Sonder.*

520. **Sonderi,** *Harv.* (PLATE LXXXVI.)
HAB. Fremantle and Garden Island, Western Australia.

521. **Muelleri,** *Sond.* (PLATE CCXCVIII.)
HAB. South coasts of New Holland, *Dr. Mueller.*

522. **angustatum,** *Sond.* (Sond. in Linn. xxv. p. 692. *Axosiphon verticillatus*, Aresch.)
HAB. South coasts of New Holland.

CXXXIV. ARESCHOUGIA, *Harvey.*

523. **australis,** *Harv.* (PLATE XIII.)
HAB. West coast of New Holland, abundantly.

524. **conferta,** *Harv.* (PLATE CLXVI.)
HAB. West and south coasts of New Holland.

525. **Stuartii,** *Harv.* (PLATE CCXCIV.)
HAB. Warnamboul, *H. Watts!* South Port, Tasmania, *C. Stuart.*

526. **Laurencia,** *Harv.* (Fl. Tasm. ii. p. 321.)
HAB. West and south coasts of New Holland. Tasmania.

527? **sedoides,** *Harv.* (PLATE CXVII.)
HAB. Western Australia, *G. Clifton!, Mylne!*

528. **gracilarioides,** *Harv.*; fronde dumosa tereti decomposite ramosissima, ramis subdichotomo-multifidis subflabelliformibus divaricato-patentibus attenuatis, ramulis sparsis filiformibus, cystocarpiis sub apice ramulorum clavæformium immersis vel in ramulis majoribus medio intumescentibus.
HAB. Western Australia, *G. Clifton!*

529. **dumosa,** *Harv.* (PLATE CCLXXXII.)
HAB. Warnamboul, *H. Watts!* Lady Bay, *Hannaford!* Port Philip (in fruit!), *Dr. Mueller!*

CXXXV. DASYPHLŒA, *Montagne.*

530. **Tasmanica,** *Hook. f. and Harv.* (PLATE CXV.)
HAB. Port Philip Heads. Tasmania.

Family XVI. SPYRIDIACEÆ.

CXXXVI. SPYRIDIA, *Harvey.*

531. **filamentosa,** *Harv.* (J. Ag. Sp. Alg. ii. p. 340.)
HAB. All round the coast of New Holland, Tasmania. (Almost all the warmer seas of both hemispheres. South coast of England.)

532. **spinella,** *Sond.* (Pl. Preiss. ii. p. 168.)
HAB. Western Australia, *Preiss.* Carnac Island, *G. Clifton!*

533. **opposita,** *Harv.* (PLATE CLVIII.)
HAB. West and south coasts of New Holland. Tasmania.

534. **prolifera,** *Harv.* (PLATE CCLXXIV.)
HAB. Fremantle, Western Australia, *G. Clifton.*

535. **dasyoides,** *Sond.* (Sond. in Linn. xxv. p. 680.)
HAB. Holdfast Bay, *Dr. Mueller.*

Family XVII. CRYPTONEMIACEÆ.

CXXXVII. GYMNOGONGRUS, *Martius.*

536. **foliosus,** *Harv.* (PLATE CXCIV.)
HAB. Port Philip Heads and Western Port.

537. **furcellatus,** *Ag.* (J. Ag. Sp. Alg. ii. p. 318.)
HAB. Port Philip Heads. Tasmania. (New Zealand. Pacific coasts of South America.)

538. **fastigiatus,** *Harv.* (PLATE CCXC.)
HAB. Forester's River, Tasmania, *Gunn!*

CXXXVIII. MYCHODEA, *Harvey.*

539. **carnosa,** *Harv.* (PLATE CXLII.)
HAB. West and south coasts of New Holland. Tasmania. (*M. Mueller*i, Sond. in Linn. xxv. p. 679.)

540. **membranacea,** *Harv.* (J. Ag. Sp. Alg. ii. p. 309.)
HAB. West and south coasts of New Holland. Tasmania.

541. **compressa,** *Harv.* (PLATE CCI.)
HAB. Western Port, Victoria.

542. **disticha,** *Harv.* (Fl. Tasm. ii. p. 323. t. 192, A.)
HAB. East coast of Tasmania, *Gunn!*

543. **terminalis,** *Harv.* (PLATE CC.)
HAB. Heads of Port Philip, *W. H. H.* Mouth of Snowy River, *Dr. Mueller!* In the Tamar, above Georgetown, Tasmania.

CXXXIX. POLYCŒLIA, *J. Agardh.*

544. **laciniata,** *J. Ag.* (J. Ag. Sp. Alg. ii. p. 306.)
HAB. West coast of New Holland, *Mus. Paris.*

545. **fastigiata,** *Harv.* (Fl. Tasm. ii. p. 324. t. 192, B.)
HAB. At the mouth of the Tamar, Tasmania, *W. H. H.*

CXL. CALLOPHYLLIS, *Kützing.*

546. **Lambertii,** *Hook. and Harv.* (J. Ag. Sp. Alg. ii. p. 300.)
HAB. West and south coasts of New Holland. Tasmania. (*Rhodocladia Lamberti*, Sond.)

547. **carnea,** *J. Ag.* (Sp. Alg. ii. p. 301.)
HAB. West coast of New Holland, *Mus. Paris.*

548. **coccinea,** *Harv.* (J. Ag. Sp. Alg. ii. p. 301.)
HAB. West and south coasts of New Holland. Tasmania.

549. **tenuifolia,** *Harv.;* fronde rosea nitente tenui-membranacea (chartæ arcte adhærente) decomposito-multifida et fimbriata, laciniis majoribus dichotomis v. alterne ramosis lato-linearibus, lacinulis marginalibus fimbriato-multifidis angustissimis acutis nunc dentatis, cystocarpiis margine lacinularum immersis. *Harv. Alg. Austr. Exsicc. n.* 404.
HAB. King George's Sound.

550. **obtusifolia,** *J. Ag.* (PLATE CXCIII.)
HAB. Western Port, Victoria, *W. H. H.*

551. **coronata,** *Harv.* (PLATE XCVII.)
HAB. Port Philip Heads, *W. H. H.*

552. **alcicornis,** *J. Ag.* (Sp. Alg. ii. p. 299.)
HAB. Coast of New Holland, *Herb. Diesing.*

553. **cervicornis,** *Sond.* (Sond. in Linn. xxv. p. 678.)
HAB. Encounter Bay, *Dr. Mueller.*

554. **australis,** *Sond.* (Pl. Preiss. ii. p. 175.)
HAB. Western Australia, *Preiss.*

CXLI. KALLYMENIA, *J. Agardh.*

555. **cribrosa,** *Harv.* (PLATE LXXIII.)
HAB. Western Australia, *G. Clifton!* Port Philip Heads, *W. H. H.* Georgetown, Tasmania, *Rev. J. Fereday!*

556. **Tasmanica,** *Harv.* (Fl. Tasm. ii. p. 325.)
HAB. Georgetown, Tasmania.

CXLII. GIGARTINA, *Lamouroux.*

557. **Radula,** *J. Ag.* (Sp. Alg. ii. p. 278.)
HAB. Port Philip Heads, *Dr. Mueller!* Warnamboul, *H. Watts!* M'Donnell Bay, *Mrs. Wehl.* (Cape of Good Hope. New Zealand. North-west coast of America.)

558. **lanceolata,** *Harv.* (PLATE CCLXXXVIII.)
HAB. Tasmania.

559. **disticha,** *Sond.* (PLATE CCXCVII.)
HAB. Western Australia, *Preiss, Mylne!, G. Clifton!*

560. **pinnata,** *J. Ag.* (PLATE LXVIII.)
HAB. South coast of Australia. Tasmania.

561. **livida,** *J. Ag.* (Sp. Alg. ii. p. 270.)
HAB. South coast of New Holland. Tasmania. (New Zealand, *Lyall!*)

562. **chondroides,** *Hook. f. and Harv.* (Fl. Tasm. ii. p. 325.)
HAB. Sandy Bay, Tasmania, *Lyall!* (Perhaps a mere variety of the following.)

HAB. Port

531. **filamentosa,** *I*
HAB. All ro
warmer seas of

532. **spinella,** *Sond*
HAB. Weste

533. **opposita,** *Har*
HAB. West

534. **prolifera,** *Har*
HAB. Frem

535. **dasyoides,** *So*
HAB. Hold

536. **foliosus,** *H*
HAB. Por

537. **furcellatus,**
HAB. Po
South Ame

538. **fastigiatus**
HAB. F

539. **carnosa,**
HAB. V
leri, Sond

540. **membran**

CXLVII. CRYPTONEMIA, *J. Agardh.*

579. **undulata,** *Sond.* (PLATE CCV.)
HAB. Port Philip, common at Brighton beach.

580 ? **decipiens,** *Harv.* (PLATE CCLXXXIX.)
HAB. Rottnest Island, Western Australia.

CXLVIII. EPYMENIA, *Kützing.*

581. **membranacea,** *Harv.* (PLATE LXXXIX.)
HAB. Georgetown, Tasmania. Wilson's Promontory, *Dr. Mueller!*

582 ? **angustata,** *Sond.;* "fronde carnosa in lacinias plures lineares elongatas dichotomas divisa, angulis obtusis, laciniis erectis subpatulis integerrimis vel hinc inde denticulatis apice obtusis." *Sond. in Linn.* xxv. *p.* 678.
HAB. St. Vincent's Gulf, *Dr. Mueller.* [Can this be our *Curdiea laciniata ?*]

583 ? **Wilsonis,** *Sond.* (Sond. in Linn. xxvi. p. 516.)
HAB. Wilson's Promontory, *Dr. Mueller.*

584. **obtusa,** *Grev.* (Sond. in Pl. Preiss. ii. p. 171.)
HAB. Western Australia, *Preiss,* fide *Sond.* (Cape of Good Hope.)

CXLIX. HOREA, *Harvey.*

585. **speciosa,** *Harv.* (Fl. Tasm. ii. p. 328. t. 194, A.)
HAB. Western Port, Victoria. Tasmania.

586. **polycarpa,** *Harv.* (Fl. Tasm. ii. p. 329. t. 194, B.)
HAB. Port Fairy, Port Philip Heads, and Western Port, Victoria, *W. H. H.* East coast of Tasmania, *Gunn!*

587. **halymenioides,** *Harv.* (PLATE LXVII.)
HAB. Fremantle and King George's Sound, very common. [Can Agardh's *Gloioderma australis* be founded on an imperfect specimen of this?]

588. **fruticulosa,** *Harv.* (PLATE CLVI.)
HAB. Port Philip Heads, rare, *W. H. H.* Western Port, *Dr. Mueller.*

CL. CHRYSYMENIA, *J. Agardh.*

589. **obovata,** *Sond.* (PLATE X.)
HAB. West and south coasts of New Holland, Tasmania.

590. **uvaria,** *J. Ag.* (J. Ag. Sp. Alg. ii. p. 24.)
HAB. Dredged in the Paramatta river, Port Jackson, *W. H. H.* (Mediterranean Sea. Key West, Florida, *W. H. H.* Pernambuco, *Herb. Areschoug!* Indian Ocean, *Wight!*)

CLI. GELINARIA, *Sonder.*

591. **ulvoidea,** *Sond.* (PLATE LXXXV.)
HAB. Fremantle and King George's Sound, Western Australia.

CLII. HALYMENIA, *Agardh.*

592. **Floresia,** *Ag.* (PLATE CCXIV.)
HAB. Garden Island, Western Australia. Port Philip Heads. (Mediterranean and Adriatic seas. Atlantic coast of Spain and North Africa. Canary Islands. Carthagena, New Granada, South America, *Schott!* Key West, Florida, *W. H. H.* Port Natal, *Sanderson!* Red Sea.)

593. **Cliftoni,** *Harv.* (PLATE CIII.)
HAB. Garden Island and Fremantle, Western Australia, *G. Clifton!* [Since this plant was figured, Mr. Clifton has favoured me with superb specimens in fruit, 14–18 inches long, and 12–14 wide, lobed and laciniated, and with a general habit like that of *Nitophyllum crispum.*]

594. **saccata,** *Harv.* (PLATE CXXXIII.)
HAB. Georgetown, Tasmania, rare, *W. Archer!*

595 ? **Muelleri,** *Sond.* (Sond. in Linn. xxv. p. 677.)
HAB. Lefebre Peninsula, *Dr. Mueller.* (*Nemastoma? gelinarioides,* Harv. Alg. Exsicc. Austr. n. 433, may probably be this plant.)

596? **chondricola,** *Sond.* (Pl. Preiss. ii. p. 172.)
HAB. Western Australia, *Preiss.*

597. **pusilla,** *Sond.* (Pl. Preiss. ii. p. 172.)
HAB. Western Australia, *Preiss.* (Very doubtful.)

CLIII. **CHYLOCLADIA,** *Greville.*

598. **Cliftoni,** *Harv.* (PLATE LVII.)
HAB. Fremantle, Western Australia, *G. Clifton!*

599. **Muelleri,** *Sond.* (PLATE CXXXVIII.)
HAB. Cape Lefebre, *Dr. Mueller!* Carnac, Western Australia, *G. Clifton!*

600. **clavellosa,** *Grev.* (J. Ag. Sp. Alg. ii. p. 366.)
HAB. Georgetown, Tasmania, Sulivan's Cove, *Lyall!* (Atlantic coasts of Europe. Falkland Islands.)

601. **secunda,** *Hook. f. and Harv.* (Fl. Nov. Zeal. ii. p. 253.)
HAB. Dredged in Port Jackson, New South Wales, *W. H. H.* (New Zealand.)

602. **divaricata,** *J. Ag.* (Sp. Alg. ii. p. 367.)
HAB. New Holland, *R. Brown.*

603. **gelidioides,** *Harv.;* fronde tubulosa (basin versus demum filis ramosis horizontalibus farcta et ideo solidescente) pinnatim ramosa hic illic articulato-constricta, ramis primariis oppositis alternisve patentibus remote articulato-constrictis, ramulis sæpius sparsis fusiformibus medio subinflatis cavis nunc 2–3-nodoso-articulatis, soris in ramulo excavatis apertis tetrasporas paucas triangule-divisas foventibus.
HAB. Twofold Bay, *Dr. Mueller!* (A remarkable plant, resembling *C. catenata* (of Japan) in miniature, but distinguished by the generally alternate ramuli and the excavated sori. It also looks like *Erythroclonium angustum,* but is less regularly constricted and of different structure.)

CLIV. **CATENELLA,** *Greville.*

604. **Opuntia,** *Grev.* (PLATE CCXCVI.)
HAB. Rocks near high-water mark. Elizabeth Bay, Port Jackson. *W. H. H.* Paramatta river, *Mr. Woolls.* (New Zealand. Atlantic and Mediterranean coasts of Europe.)

CLV. **GATTYA,** *Harvey.*

605. **pinnella,** *Harv.* (PLATE XCIII.)
HAB. Rottnest Island, Western Australia, *W. H. H.* Warnamboul, *H. Watts.*

CLVI. PRIONITIS, *J. Agardh.*

606. **microcarpa,** *J. Ag.* (Sp. Alg. ii. p. 187.)
HAB. West coast of New Holland, *Mus. Paris.* Encounter Bay, *Dr. Mueller.*

607. **australis,** *J. Ag.* (Sp. Alg. ii. p. 188.)
HAB. Southern Ocean, *Herb. Agardh.* (Locality uncertain.)

608. **Sternbergii,** *J. Ag.* (Sp. Alg. ii. p. 190.)
HAB. Southern Ocean, *Hænke.* (Locality uncertain.)

CLVII. GRATELOUPIA, *Agardh.*

609. **gigartinoides,** *Sond.* (Sond. in Linn. xxvi. p. 517.)
HAB. Port Philip, *Dr. Mueller.* (Unknown to me.)

CLVIII. SCHIZYMENIA, *J. Agardh.*

610? **bullosa,** *Harv.* (PLATE CCLXXVII.)
HAB. Western Australia, *G. Clifton.*

CLIX. NEMASTOMA, *J. Agardh.*

611. **Feredayæ,** *Harv.* (Fl. Tasm. ii. p. 327. t. 195. A.)
HAB. Georgetown, Tasmania, *Mrs. Fereday.* Western Port, *W. H. H.*

612? **palmata,** *Harv.* PLATE CCLXII.)
HAB. Tasmania, *Miss Brown!*

613? **comosa,** *Harv.* (PLATE CIX.)
HAB. Western Port, Victoria, *W. H. H.*

CLX. GULSONIA, *Harvey.*

614. **annulata,** *Harv.* (Fl. Tasm. ii. p. 320. t. 193 A.)
HAB. Philip Island, Western Port, *W. H. H., Dr. Mueller!* Georgetown, Tasmania.

Family XVIII. CERAMIACEÆ.

CLXI. CENTROCERAS, *Kützing.*

615. **clavulatum,** *Ag.* (J. Ag. Sp. Alg. ii. p. 148.)
HAB. West and south coasts of New Holland. (Warmer seas of both hemispheres. New Zealand.)

616. **cinnabarinum,** *J. Ag.* (J. Ag. Sp. Alg. p. 148.)
HAB. St. Kilda, Port Philip, *H. Watts!* (Adriatic and Mediterranean Seas, *J. Agardh.*

CLXII. CERAMIUM, *Agardh.*

617. **cancellatum,** *Ag.* (J. Ag. Sp. Alg. ii. p. 136.)
HAB. Sealer's Cove, *Dr. Mueller.* (New Zealand. Cape of Good Hope.

618. **rubrum,** *Ag.* (J. Ag. Sp. Alg. ii. p. 127.)
HAB. Coasts of Australia and Tasmania. (Cosmopolitan.)

619. **pusillum,** *Harv.*; fronde parvula dichotoma fastigiata disticha, segmentis erecto-patentibus, apicibus incurvis, articulis omnibus brevibus corticatis, inferioribus diametro æqualibus ad genicula non contractis, tetrasporis circa

genicula verticillatis, ramellis involucri 3–4 favellas vix superantibus. *Harv. Alg. Exsicc. n.* 474.

HAB. Western Australia, *G. Clifton!* Port Fairy, *W. H. H.* Warnamboul, *H. Watts!*

620. **isogonum,** *Harv.* (PLATE CCVI.)

HAB. Western Australia. Port Fairy, Victoria. Tasmania, *Mr. M'Gowan!*

621. **diaphanum,** *Roth.* (J. Ag. Sp. Alg. ii. p. 125.)

HAB. West and south coasts of New Holland. Tasmania. (Nearly cosmopolitan.)

622. **australe,** *Sond.* (J. Ag. Sp. Alg. ii. p. 124.)

HAB. West and south coasts of New Holland.

623. **gracillimum,** *Kütz.* (J. Ag. Sp. Alg. ii. p. 118.)

HAB. Georgetown, Tasmania. (Coasts of Europe. Keys of Florida. West Indies. Friendly Islands.)

624. **ramulosum,** *H. and H.* (J. Ag. Sp. Alg. ii. p. 121.)

HAB. Tasmania, in the Tamar.

625. **fastigiatum,** *Harv.* (J. Ag. Sp. Alg. ii. p. 119.)

HAB. Fremantle, Western Australia. (Atlantic and Mediterranean shores of Europe. North America.)

626. **puberulum,** *Sond.* (*C. monile,* H. and H.; J. Ag. Sp. Alg. ii. p. 132.)

HAB. West and south coasts of New Holland. Tasmania.

627. **miniatum,** *Suhr.* (PLATE CCVI. A.)

HAB. Swan River. Kiama, New South Wales. (Shores of Peru.)

628. **repens,** *Harv.;* pusillum, filo primario prostrato radicibus discoideis prorepente ramulos erectos liberos emittente, ramulis secundis simplicibus, articulis diametro subtriplo-longioribus, interstitiis nudis, tetrasporis ad genioula singulis unilateralibus prominentibus. *Harv. in Hb. Lenorm. ms.*

HAB. Parasitical on corallines. Port Philip, *Dr. Mueller!* (Quite distinct from *C. reptabundum,* of which it has somewhat the habit.)

CLXIII. PTILOCLADIA, *Sonder.*

629. **pulchra,** *Sond.* (PLATE CCIX.)

HAB. Western Australia, *Preiss, Backhouse, W. H. H., Clifton.* South Australia, *Dr. Curdie.*

CLXIV. HALOPLEGMA, *Montagne.*

630. **Preissii,** *Sond.* (PLATE LXXIX.)

HAB. Abundant on the west and south coasts of New Holland. In the Tamar, Tasmania.

CLXV. BRACHYCLADIA, *Sonder.*

631. **australis,** *Sond.* (Sond. in Linn. xxvi. p. 514.)

HAB. Wilson's Promontory, *Dr. Mueller,* 1853. (Unknown to me.)

CLXVI. DUDRESNAIA, *Bonnemaison.*

632. **coccinea,** *Bonnem.* (J. Ag. Sp. Alg. ii. p. 108.)

HAB. King George's Sound, very rare, *W. H. H.* (Atlantic and Mediterranean coasts of Europe.)

CLXVII. **CROUANIA**, *J. Agardh.*

633. **insignis**, *Harv.* (Fl. Tasm. ii. p. 331. t. 193, B.)
HAB. South coasts of New Holland. Tasmania.

634. **vestita**, *Harv.* (PLATE CXL.)
HAB. Western Australia.

635. **attenuata**, var. **australis**, *Harv.* (J. Ag. Sp. Alg. ii. p. 105.)
HAB. King George's Sound. Table Cape, Tasmania. (Atlantic and Mediterranean coasts of Europe. Keys of Florida.)

636. **Agardhiana**, *Harv.* (PLATE CCLVI.)
HAB. King George's Sound.

637. **Wattsii**, *Harv.* (PLATE CCXCI.)
HAB. Warnamboul, *H. Watts.*

638. **Muelleri**, *Harv.*; fronde rigidiuscula (non gelatinosa) pellucide articulata ecorticata decomposite ramosissima, ramis ramulisque sparsis sursum attenuatis ad genicula omnia verticillatim ramellosis, ramellis minutis tetrastichis dichotomo-multifidis obtusis, articulis ramellorum diametro sesquilongioribus.
HAB. Philip Island, Western Port, *Dr. Mueller!* (This has the size and habit of *C. Agardhiana*, but a pellucidly-jointed stem, as in *C. attenuata*. It is the least gelatinous of the ecorticate section.)

CLXVIII. **DASYPHILA**, *Sonder.*

639. **Preissii**, *Sond.* (PLATE LXVI.)
HAB. West and south coasts of Australia.

CLXIX. **THAMNOCARPUS**, *Harvey.*

640. **Gunnianus**, *Harv.* (Hook. Ic. Pl. t. 662.)
HAB. Georgetown, Tasmania. South Australia. Western Australia, *Harv. Alg. Exsicc. n.* 482. (I am doubtful whether or not the Western Australian plant be specifically identical with that of Tasmania. If not, it is very nearly allied to it.)

CLXX. **PTILOTA**, *Agardh.*

641. **Jeannerettii**, *Harv.* (PLATE CXCVIII.)
HAB. South coast of New Holland. Tasmania.

642. **coralloidea**, *J. Ag.* (J. Ag. Sp. Alg. ii. p. 101.)
HAB. West and south coasts of New Holland.

643. **articulata**, *J. Ag.* (Sp. Alg. ii. p. 100.)
HAB. West and south coasts of New Holland. Tasmania.

644. **Rhodocallis**, *Harv.* (PLATE XLIV.)
HAB. South coast of New Holland. Rare in Tasmania.

645. **striata**, *Harv.* (PLATE LXXI.)
HAB. Rottnest Island, Western Australia.

646. **siliculosa**, *Harv.*; fronde complanata costata decomposite ramosissima, ramis majoribus alternis sparsisve, minoribus linearibus pectinato-pinnatifidis, pinnulis e basi lata subulatis alternis simplicissimis, tetrasporis in glomerula siliquæformia e pinnularum latere superiore enata congestis, ad fila callithamnoidea brevissima circum axim verticillata affixis. *Harv. in Trans. R. I. Acad.* xxii. *p.* 559.
HAB. Western Australia, *Mylne.* Rottnest, *W. H. H.*

647? **Hannafordi,** *Harv.* (PLATE CCXXI.)
HAB. Rare. Port Fairy, *W. H. H.* Lady Bay, *Mr. Hannaford.* Port Fairy, *Watts.*

CLXXI. **GRIFFITHSIA,** *Agardh.*

648. **ovalis,** *Harv.* (PLATE CCIII.)
HAB. King George's Sound.

649. **monilis,** *Harv.* (Fl. Tasm. ii. p. 332, t. 195. B.)
HAB. West and south coasts of New Holland. Tasmania.

650. **Binderiana,** *Sond.* (PLATE LII.)
HAB. Garden and Rottnest Islands, Western Australia, common. Rare, at Warnamboul, *H. Watts!*

651. **corallina,** *Ag.* (J. Ag. Sp. Alg. ii. p. 78.)
HAB. Western Australia, *G. Clifton!* Geelong, Port Philip, *W. H. H.* Tasmania, *Gunn, etc.* (Atlantic and Mediterranean coasts of Europe. East coast of North America.)

652. **antarctica,** *Hook. f. and Harv.* (Fl. Tasm. ii. p. 332.)
HAB. Warnamboul, *H. Watts!* Tasmania. (Antarctic islands. New Zealand.)

653. **Teges,** *Harv.* (In Trans. R. I. Acad. xxii. p. 559. Imperfectly known. Perhaps a mere variety of *G. antarctica.* It forms enormous, coarse, mat-like strata, 1–2 feet wide.)
HAB. Cast ashore at Fremantle, Western Australia.

654. **setacea,** *Ag.* (J. Ag. Sp. Alg. ii. p. 84.)
HAB. Tasmania, abundantly. Warnamboul, *H. Watts.* (Atlantic and Mediterranean coasts of Europe. New Zealand.)

655. **gracilis,** *Harv.* (Fl. Tasm. ii. p. 332.)
HAB. Georgetown, Tasmania, *W. H. H.*

CLXXII. **BALLIA,** *Harvey.*

656. **callitricha,** *Ag.* (J. Ag. Sp. Alg. ii. p. 75.)
HAB. Western Australia, rare, *G. Clifton.* South coast of New Holland and in Tasmania, abundantly. (Antarctic lands and islands. New Zealand.)

657. **Robertiana,** *Harv.* (PLATE XXXVI.)
HAB. Guichen Bay, *Dr. Mueller.* Armstrong's Bay, Port Fairy. Warnamboul, *H. Watts!* South Port, Tasmania, *C. Stuart.* Port Philip Heads, *Dr. Mueller.*

658. **Mariana,** *Harv.* (PLATE CCXII.)
HAB. Port Fairy. Warnamboul, *H. Watts!* Port Philip Heads, *Dr. Mueller!*

659. **scoparia,** *Harv.* (PLATE CLXVIII.)
HAB. South coast of New Holland. Tasmania. (New Zealand. Falkland Islands.)

CLXXIII. **CORYNOSPORA,** *J. Agardh.*

660. **australis,** *Harv.* (PLATE CCLIII.)
HAB. Rottnest, *W. H. H.* Fremantle, Western Australia, *G. Clifton.* Port Philip, *Dr. Mueller.*

661. **gracilis,** *Harv.*; fronde pusilla (unciali) tenui alterne ramosa v. subdicho-

toma, ramulis quoquoversum egredientibus inferioribus furcatis superioribus bis terve dichotomis, apicibus subattenuatis obtusiusculis. *Harv. in Trans. R. I. Acad.* xxii. *p.* 559.

HAB. Garden Island, Western Australia, rare, *W. H. H.* Mouth of the Snowy River, Victoria, *Dr. Mueller!*

662. **arachnoidea,** *Harv.* (Fl. Tasm. ii. p. 333.)
HAB. Georgetown, Tasmania, *W. H. H.*

CLXXIV. CALLITHAMNION, *Lyngbye.*

Sect. 1. DASYTHAMNION.—*Frons majuscula, stuposo-spongiosa, caule ramisque plus minus filis decurrentibus intricatis liberis et anastomosantibus velatis.*

663. **plumigerum,** *Harv.* (PLATE CCLXXXV.)
HAB. Cape Liptrap, *Dr. Mueller.* South coasts of Australia.

664. **dasyurum,** *Harv.;* fronde intense rubra spongioso-stuposa bi-tri-pectinato-pinnata, pinnis pinnulisque strictis virgatis filis decurrentibus intertextis densissime velatis et etiam ramellis minimis onustis quasi hirsutissimis, ramulis (v. pinnulis) junioribus vix stuposis creberrime alterne plumulatis, plumulis minutis oblongis pectinato-pinnatis, earum pinnellis elongatis in curvis simplicibus v. basi ramuliferis, articulis omnibus brevissimis. *Harv. Alg. Exsicc.* 505.
HAB. Port Philip Heads, rare, *W. H. H.*

665. **paradoxum,** *Harv.* (Fl. Tasm. ii. p. 337.)
HAB. Broun's River, Tasmania, *Gunn!* Warnamboul, *H. Watts!*

666. **conspicuum,** *Harv.* (Fl. Tasm. ii. p. 335.)
HAB. Cape Liptrap, *Dr. Mueller,* 1853. South coast of New Holland. Tasmania. (*Spongoclonium conspicuum,* Sond. Linn. xxvi. p. 515. *C. tingens,* Harv. Alg. Exsicc. n. 508.)

667. **Brounianum,** *Harv.;* fronde ultra-setacea (4-unciali) subecorticata sursum longe pilis squarrosis stuposo-hirsuta quoquoversum ramosissima, ramis pluries alterne decompositis, penultimis quoquoversis pellucide articulatis nodosis (parietibus cellularum crassis gelatinosis), alterne plumulatis, plumulis quoquoversis brevibus crispis pinnatis, pinnis capillaribus longissimis maxime curvatis inflexis, articulis pinnularum diametro 4-plo longioribus, tetrasporis brevissime pedicellatis solitariis v. geminis ad latera pinnularum enatis. *Harv. in Trans. R. I. Acad.* xxii. *p.* 561.
HAB. Western Australia, on *Zostera.*

667*a*. **Brounianum,** var.? **majus;** fronde majori (8–12-unciali) decomposito-ramosissima magis stuposa. *Harv. Alg. Austr. Exsicc.* 511 *bis.*
HAB. Western Australia, *G. Clifton.* Port Fairy, *W. H. H.* (Much larger and more luxuriant than the original specimens on which the species was founded; possibly distinguishable?)

668. **superbiens,** *Harv.;* fronde rosea mollissima elata sursum longe corticata decomposite pinnata disticha, ramis majoribus corticatis opacis, minoribus subecorticatis articulatis pinnatim ramulosis, ramis alternis pellucide articulatis simplicibus crebre plumulatis, plumulis tenuibus 2–3-pinnulatis, pinnellis divaricatis multifidis attenuatis, articulis ramulorum diametro 2–3-plo longioribus ad genicula nodoso-incrassatis, plumularum brevissimis, tetrasporis triangule divisis sparsis. *Harv. Alg. Exsicc. n.* 511 (*ex parte*).
HAB. Western Port, *W. H. H.*

669. **formosum,** *Harv.* (PLATE CCLXXXI.)
HAB. Port Philip Heads, rare, *W. H. H.*

670. **Wollastonianum,** *Harv.;* fronde ultra-setacea elata (4–5-unciali) basi tenuiter corticata sursum longe pilis squarrosis stuposo-hirsuta subdistiche ramosissima, ramis alternis decomposito-pinnatis, penultimis distichis pellucide articulatis alterne plumulatis, plumulis patentibus longissimis ambitu linearibus, pinnis tenuibus erectiusculis brevibus, inferioribus simplicibus, superioribus sæpius furcatis v. pinnulatis, tetrasporis solitariis ad ramulos brevissime pedicellatis; articulis diametro 2–4-plo longioribus. *Harv. in Trans. R. I. Acad.* xxii. *p.* 561.
HAB. Middleton Bay, King George's Sound, rare.

Sect. 2. ARBUSCULA.—*Frons majuscula, fruticosa v. arborescens, caule ramisque opacis corticatis.*

671. **latissimum,** *Harv.* (Fl. Tasm. ii. p. 334.)
HAB. Georgetown, Tasmania.

672. **laricinum,** *Harv.* (PLATE CCXVIII.)
HAB. West and south coasts of Australia.

673? **penicillatum,** *Harv.* (PLATE CCLXXIII.)
HAB. On *Macrocystis*, at Port Philip Heads.

Sect. 3. RHODOTHAMNION.—*Frons articulata, sæpius decomposito-pinnata, pinnis pinnulisque alternis.*

674. **angustatum,** *Hook. f. and Harv.* (Fl. Tasm. ii. p. 334.)
HAB. Georgetown, Tasmania.

675. **violaceum,** *Harv.* (Fl. Tasm. ii. p. 334.)
HAB. On the piles of the jetty, Georgetown, Tasmania.

676. **crispulum,** *Harv.;* fronde pusilla (½–¾-unciali) capillari ecorticata cæspitosa inferne quoquoversum, superne distiche ramosa, ramis superioribus e rachide flexuosa alterne plumulatis, plumulis brevissimis alterne pinnatis, pinnis 3–4 simplicissimis filiformibus elongatis obtusis eximie arcuato-inflexis, articulis omnibus diametro sesquilongioribus, favellis geminis, tetrasporis . . . ? *Harv. in Trans. R. I. Acad.* xxii. *p.* 562.
HAB. Shady crevices of rocks, at half-tide level. Rottnest, Western Australia.

677. **pusillum,** *Harv.;* fronde pusilla (vix unciali) capillari ecorticata cæspitosa inferne simpliciuscula superne quoquoversum ramosa, ramis inferne plumulatis, superne alterne ramosis, ramis minoribus e rachide strictiuscula quoquoversum plumulatis, plumulis brevissimis vix pinnatis, pinnis 2–3 alternis v. secundis elongatis obtusis arcuatis inflexis, articulis omnibus nisi basilaribus diametro 3-plo longioribus, favellis geminis, tetrasporis globosis ad latera pinnarum solitariis. *Harv. in Trans. R. I. Acad.* xxii. *p.* 562.
HAB. Crevices of rocks. Rottnest Island, Western Australia, *W. H. H.*

678. **scopula,** *Harv.;* fronde pusilla (unciali) capillari ecorticata quoquoversum ramosa, ramis paucis cum ramulis ambitu clavatis quoquoversum plumulatis, plumulis inferioribus brevibus, superioribus elongatis pinnatis, pinnis simplicibus filiformibus longissimis arcuato-incurvis obtusis, articulis omnibus diametro 2–3-plo longioribus, tetrasporis ellipsoideis numerosis secus pinnas sessilibus. *Harv. in Trans. R. I. Acad.* xxii. *p.* 562.
HAB. Crevices of rocks, Rottnest Island, Western Australia, *W. H. H.*

679. **debile,** *Harv.;* fronde vix unciali tenuissima ecorticata cæspitosa inferne quoquoversum superne distiche ramosa, ramis paucis alterne divisis, minoribus distiche ramulosis, ramulis patentissimis inferioribus spinæformibus

superioribus furcatis v. pinnulatis, articulis inferioribus diametro 5–8-plo, ramulorum 3–4-plo longioribus, tetrasporis solitariis ad ramulos sessilibus. *Harv. in Trans R. I. Acad.* xxii. *p.* 563.
HAB. Rottnest, Western Australia, rare.

Sect. 4. GRIFFITHSIOIDES.—*Frons articulata, decomposite ramosa v. dichotoma, ramulis dichotomo-multifidis fastigiatis.*

680. **elongatum,** *Harv.* (Fl. Tasm. ii. p. 336.)
HAB. South coast of New Holland. Tasmania.

681. **licmophorum,** *Harv.* (PLATE XC.)
HAB. Garden Island and Carnac, *G. Clifton!* Warnamboul, *H. Watts.* Port Philip Heads and Western Port, *W. H. H.*

682. **Griffithsioides,** *Sond.* (PLATE CIX.)
HAB. Wilson's Promontory, *Dr. Mueller.* Port Fairy, *W. H. H.* Georgetown, Tasmania, *R. Gunn!* M'Donnell Bay, *Mrs. Wehl!*

683. **flabelligerum,** *Harv.;* fronde erecta crassiuscula alterne decomposito-ramosa omnino ecorticata, ramis ramulisque quoquoversum egredientibus, terminalibus corymboso-flabellatis, ramulis dichotomo-multifidis fastigiatis, apicibus obtusis patentibus, favellis geminis rotundatis ramulis stipatis (quasi involucratis). *Harv. in Trans. R. I. Acad.* xxii. *p.* 562.
HAB. Garden and Rottnest Islands, Western Australia.

684. **fastigiatum,** *Harv.* (Fl. Tasm. ii. p. 336.)
HAB. Georgetown, Tasmania, *R. Gunn!*

685. **longinode,** *Harv.;* fronde tenuissima pellucide articulata decomposite dichotoma subfastigiata, axillis acutis, apicibus attenuatis, articulis omnibus diametro pluries longioribus cylindraceis, tetrasporis?
HAB. In tide-pools, Warnamboul, *H. Watts,* 219. (This seems nearest *C. fastigiatum,* but certainly distinct. Its fruit is a desideratum.)

686. **multifidum,** *Harv.;* fronde pusilla (unciali) arachnoidea ecorticata dense cæspitosa alterne ramosa, ramis simplicibus ramosisve, ramulis alternis quoquoversis dichotomo-multifidis, divisuris patentibus obtusis, articulis ramorum basi incrassatis diametro 4-plo, ramulorum cylindraceis diametro 2–4-plo longioribus. *Harv. in Trans. R. I. Acad.* xxii. *p.* 562.
HAB. Sand-covered rocks, Rottnest Island, Western Australia.

Sect. 5. PLUMULA.—*Frons articulata, varie ramosa, sæpius pinnata, ramulis oppositis.*

687. **comosum,** *Harv.* (Lond. Journ. Bot. iii. p. 451.)
HAB. In the Tamar, above Georgetown, Tasmania.

688. **mucronatum,** *J. Ag.* (Fl. Tasm. ii. p. 333. *Spyridia pellucida,* Harv. in Lond. Journ. iii. p. 449. *Callith. acanthocarpum,* Kütz.)
HAB. Western Australia, *G. Clifton.* Warnamboul, *H. Watts.* Western Port, *W. H. H.* Tasmania.

689. **cruciatum,** *Ag.* (J. Ag. Sp. Alg. ii. p. 28.)
HAB. Sealer's Cove, *Dr. Mueller.* Georgetown, Tasmania, *Gunn, W. H. H.* (Atlantic and Mediterranean shores of Europe.)

690. **Plumula,** *Ag.* (J. Ag. Sp. Alg. ii. p. 29.)
HAB. Georgetown, Tasmania, rare. (Atlantic and Mediterranean shores of Europe. North America. New Zealand. Cape Horn.)

691. **simile,** *Hook. f. and Harv.* (PLATE CCVII.)
HAB. West and south coasts of New Holland. (Kerguelen's Land.)

692. **pulchellum,** *Harv.;* pusillum (semiunciale), filo primario ramisque primariis prostratis repentibus demum ramos erectos simplices v. parum ramosos emittentibus, ramis omnibus e quoque articulo opposite v. cruciatim plumulatis, plumulis infra articuli apicem egredientibus patentibus ambitu ovatis pinnatis, pinnis simplicissimis approximatis obtusis, articulis ramorum diametro 2–4-plo longioribus pinnarum et pinnellarum diametro brevioribus, favellis simplicibus rachidem plumulæ terminantibus, tetrasporis e pinnellis abbreviatis formatis. *Harv. in Trans. R. I. Acad.* xxii. *p.* 561.
HAB. Parasitic on various Algæ, west and south coasts of New Holland.

693. **australe,** *J. Ag.* (Sp. Alg. ii. p. 26.)
HAB. Parasitic on Algæ.

694. **Preissii,** *Sond.* (J. Ag. Sp. Alg. ii. p. 33.)
HAB. Parasitic on Algæ.

695. **dimorphum,** *Harv.;* filis erectis (uncialibus) capillaribus solitariis parum ramosis, ramis simpliciusculis patentibus cum filo primario e quoque articulo opposite plumulatis, plumulis e medio articuli egredientibus subdistichis patentibus ambitu ovatis pinnatis pinnis furcatis, infima nunc simplici, articulis diametro æqualibus v. sesquilongioribus, apicibus acutis, tetrasporis solitariis ramulum pusillum pinnarum terminantibus. *Call. horizontale* (plumulis horizontalibus) et *Call. verticale* (plumulis verticalibus), *Harv. in Trans. R. I. Acad.* xxii. *pp.* 560, 561.
HAB. Western Australia, parasitic on Algæ.

696. **spinescens,** *Kütz.* (J. Ag. Sp. Alg. ii. p. 33.)
HAB. Parasitic. Western Australia.

697. **Hanowioides,** *Sond.* (Sond. in Linn. xxv. p. 674.)
HAB. West and south coasts of Australia, very common. [This is what I have distributed under the name "*C. spinescens,*" Alg. Exsicc. Austr. n. 540. According to Sonder, it is not Kützing's plant.]

698. **dispar,** *Harv.* (PLATE CCXXVII.)
HAB. South coast of New Holland. Tasmania.

699. **Muelleri,** *Sond.* (Sond. in Linn. xxvi. p. 513.)
HAB. Parasitic on Fucoids. South coast of New Holland, *Dr. Mueller, W. H. H., etc.*

700. **aculeatum,** *Harv.;* filo primario repente, secundariis erectis (subunciali-bus) capillaribus subdichotomis v. alterne ramosis corymboso-fastigiatis, ramis quoquoversum egredientibus, minoribus caule duplo-angustioribus, ramulis ad genicula fere omnia verticillatis spinæformibus patentissimis brevissimis simplicibus subacutis, tetrasporis solitariis ad ramulos lateralibus, articulis ramorum diametro 2–3-plo longioribus. *Harv. in Trans. R. I. Acad.* xxii. *p.* 560.
HAB. On Zostera. King George's Sound, *W. H. H.*

701. **gracilentum,** *Harv.;* minutum (1–2-lineas altum), filo primario repente crasso ramos suboppositos libêros emittente, ramis filo primario quadruplo-angustioribus pinnatis, pinnis oppositis patentibus simplicibus v. latere inferiori subramellosis subattenuatis obtusiusculis, fili primarii articulis diametro sesqui- v. subduplo, ramorum 4–5-plo, ramulorum sesquilongioribus. *Harv. in Trans. R. I. Acad.* xxii. *p.* 560.
HAB. Parasitic on Fucoids. Rottnest Island, Western Australia.

702. **delicatulum,** *Harv.;* pusillum, arachnoideum, filo primario repente, secundariis erectis (vix uncialibus) parum ramosis e quoque geniculo plumulatis, plumulis oppositis per paria decussatis infra apicem articuli egredientibus tenuibus laxe pinnatis, pinnulis inferioribus sæpius oppositis, reliquis alternis e rachide flexuosa emissis omnibus attenuatis simplicibus v. ramulo uno alterove auctis. *Harv. in Trans. R. I. Acad.* xxii. *p.* 560.
HAB. Parasitic on *Solieria australis.* King George's Sound.

703. **flaccidum,** *Hook. f. and Harv.* (Fl. Antarct. ii. p. 490, t. 188. f. 1.)
HAB. Geelong, Port Philip. Tasmania. (New Zealand. St. Martin's Cove, Cape Horn.)

704. **Turneri,** *Ag.* (J. Ag. Sp. Alg. ii. p. 23.)
HAB. Port Arthur, Tasmania, *W. H. H.* (Atlantic and Mediterranean shores of Europe. North America.)

Sect. 6. PULVINATA.—*Frons nana, rupestris, articulata, dense cæspitosa, varie ramosa.*

705. **thyrsigerum,** *Thw.;* filis primariis repentibus, secundariis erectis cæspitosis capillaribus (1–1½-uncialibus) vage ramosis, ramis minoribus sæpissime secundis filiformibus simplicissimis acuminatis, articulis diametro 3–5-plo longioribus cylindraceis, tetrasporis circa genicula suprema ramorum verticillatis pedicellatis, pedicellis ramosulis thyrsoideo-paniculatis, favellis terminalibus involucratis. *Harv. in Trans. R. I. Acad.* xxii. *p.* 559.
HAB. Parasitic on Algæ and Zostera. Rottnest Island, Western Australia, and King George's Sound. [Nearly allied to *Call. (Griffithsia ?) tenue,* J. Ag.] (Ceylon.)

706. **floridulum,** *Ag.* (J. Ag. Sp. Alg. ii. p. 19.)
HAB. Western Port, Victoria, *W. H. H.* (Shores of Europe.)

707. **cymosum,** *Harv.;* densissime cæspitosum, filis primariis repentibus intricatis, secundariis erectis arachnoideis (uncialibus) vage ramosis, ramis subdichotomis v. alternis, minoribus filiformibus erectis longe simplicibus obtusis, articulis diametro multoties (8–12-plo) longioribus cylindraceis; tetrasporis in cymulis veris æqualibus v. scirpoideis secus ramos dispositis, favellis ?
HAB. On sand-covered rocks. Rottnest Island, Western Australia, and King George's Sound, *W. H. H.*

Sect. 7. PARASITICA.—*Parasitæ nanæ v. minimæ, frondibus articulatis alterne ramosis.*

708. **minimum,** *Harv.;* parasiticum (vix lineam altum), fronde erecta solitaria disticha pinnatim ramosa, ramis alternis erecto-patentibus dissimilibus, aliis simplicibus, aliis secunde pectinatis v. bipectinatis, articulis diametro sesquilongioribus.
HAB. On the ramenta of *Caulerpa Harveyi,* at Port Fairy.

709. **sparsum,** *Harv.* (Phyc. Brit. t. 297.)
HAB. On *Sporochnus scoparius,* at Garden Island, Western Australia. (Specimens not in fruit.)

710. **botryocarpum,** *Harv.;* nanum, penicillato-cæspitosum, filis minutis (1–2 lineas altis) e basi ramosissimis, ramis alternis v. secundis patentibus flexuosis nunc subsquarrosis, articulis diametro 4-plo longioribus, tetrasporis magnis triangule divisis in glomerula ad axillas ramorum densissime

aggregatis, antheridiis botryoideis e quoque fere articulo ramorum sæpe evolutis. *Harv. in Trans. R. I. Acad.* xxii. *p.* 563.

HAB. Parasitic on *Chorda lomentaria*. King George's Sound, *W. H. H.*

711. **radicans**, *Harv.*; nanum, parasiticum, velutino-cæspitosum, filis minutis (2 lineas altis) fibrillis crispatis radicantibus e basi ramosissimis, ramis primariis alternis secundisve 2–3-ties decompositis, minoribus ramulisque secundis strictis, articulis cylindraceis diametro 4–5-plo longioribus, ramulis fructiferis prope basin ramorum sparsis simplicibus v. parum ramosis, tetrasporis ellipsoideis terminalibus.

HAB. On Zostera. Fremantle, Western Australia, *W. H. H.*

712. **polyrhizum**, *Harv.*; nanum, parasiticum, filis brevibus (3–6 lineas altis) penicillatis basi cæspitosis radicantibus, radicibus matricem verticaliter penetrantibus strictis, caulibus parce ramosis, ramis alternis virgatis ramulosis, ramulis alternis secundisve perbrevibus patentibus, articulis ramorum diametro 2–4-plo longioribus, tetrasporis latere interiore ramulorum pedicellatis. *Harv. Alg. Exsicc. n.* 520.

HAB. On *Codium tomentosum*, at Port Fairy.

Series III. CHLOROSPERMEÆ.

Family XIX. SIPHONACEÆ.

CLXXV. CAULERPA, *Lamouroux.*

713. **parvifolia**, *Harv.* (PLATE CLXXII.)

HAB. Kiama, New South Wales.

714. **scalpelliformis**, *R. Br.* (PLATE XVII.)

HAB. West and south coasts of Australia. (Indian Ocean. Red Sea.)

715. **remotifolia**, *Sond.* (PLATE CVII.)

HAB. Lefebre Peninsula, 1852, *Dr. F. Mueller.*

716. **taxifolia**, *Ag.* (PLATE CLXXVIII.)

HAB. Albany Island, North Australia, *Dr. Mueller.* (India and Pacific Oceans. Hongkong, *Wright.* Friendly Islands, *W. H. H.* West Indies.)

717. **distichophylla**, *Sond.* (PLATE CLXI.)

HAB. Jetty at Rottnest Island, Western Australia.

718. **cactoides**, *R. Br.* (PLATE XXVI.)

HAB. West and south coasts of Australia. (Isle of Toud, *Mont.*)

719. **cylindracea**, *Sond.* (PLATE XXX.)

HAB. Western Australia. (Marquesas Islands?)

720. **sedoides**, *R. Br.* (PLATE LXXII.)

HAB. West, south, and east coasts of Australia. Tasmania. (Friendly Islands, *W. H. H.* Indian Ocean, *Wight.* Mauritius, *Mrs. Telfair.* New Zealand, *Lyall*, etc. Red Sea. (*C. lentillifera*, J. Ag.))

721. **vesiculifera**, *Harv.* (*C. simpliciuscula*, var. *β. vesiculifera*, Harv. PLATE LXV. Fig. 3, 4.)

HAB. Western Port, *W. H. H.*, *Dr. Mueller!* Port Philip, *Mr. Rawlinson!* Georgetown, Tasmania, *R. Gunn.* [This seems to be really distinct from the following, on the evidence of numerous specimens, collected at various times.]

722. **simpliciuscula,** *R. Br.* (PLATE LXV. Fig. 1, 2.)
HAB. West and south coasts of Australia. Tasmania.

723. **Brownii,** *Endl.* (Fl. Nov. Zel. pl. 121.)
HAB. Port Arthur, Tasmania. (New Zealand.)

724. **furcifolia,** *Hook. f. and Harv.* (Fl. Nov. Zel. t. 121.)
HAB. South coast of Australia and Tasmania, common. (New Zealand.)

725. **hypnoides,** *R. Br.* (PLATE LXXXIV.)
HAB. West, south and east coasts of Australia. Tasmania. (New Zealand.)

726. **Muelleri,** *Sond.* (PLATE II.)
HAB. West and south coasts of Australia. Rivoli Bay, *Dr. Mueller.*

727. **Sonderi,** *Muell.* (PLATE CLXVII.)
HAB. West and south coasts of Australia.

728. **Cliftoni,** *Harv.;* surculo crasso glabro lævique, fronde erecta simplici per totam longitudinem ramentis filiformibus obsessa, ramentis diversis, infimis subulatis brevibus, inferioribus elongatis furcatis v. trifidis, superioribus et supremis distanter pinnatis, pinnulis paucis alternis filiformibus incurvis acutis.
HAB. Western Australia, *G. Clifton!* (A single imperfect specimen only as yet seen (July, 1863), but this is quite unlike any known to me.)

729. **Harveyi,** *Muell.* (PLATE XCV.)
South coast of Australia. Tasmania.

730. **trifaria,** *Harv.* (PLATE CCLXI.)
HAB. Port Philip Heads, *W. H. H.* Port Arthur, Tasmania, *W. H. H.* (This may possibly be an extremely depauperated variety of *C. Harveyi.*)

CLXXVI. HALIMEDA, *Lamouroux.*

731. **incrassata,** *Lamx.* (PLATE CXXV.)
HAB. Albany Island, trop., *Dr. Mueller!* Queensland, *Mr. Fitzalan!* (The tropical ocean generally.) Keys of Florida.

732. **macroloba,** *Lamx.* (PLATE CCLXVII.)
HAB. Western Australia. Cape Riche. (Tropical ocean.)

CLXXVII. CODIUM, *Agardh.*

733. **tomentosum,** *Ag.* (Harv. Phyc. Brit. t. 93.)
HAB. Coasts of Australia and Tasmania. (Nearly cosmopolitan; found throughout the tropical and temperate oceans of both hemispheres. Antarctic seas.)

734. **elongatum,** *Ag.* (Ag. Syst. p. 177.)
HAB. Port Philip, *Mr. Rawlinson!* (Cape of Good Hope. Mediterranean Sea.) [By many regarded as a mere variety of *C. tomentosum.*]

735. **laminarioides,** *Harv.;* stipite brevi cuneato mox in frondem amplissimam (2–3-pedalem) planam subsimplicem v. parce lobatam expanso. *Harv. in Trans. R. I. Acad.* xxii. p. 565.
HAB. Rottnest Island, Western Australia; and King George's Sound, *W. H. H.*

736. **spongiosum,** *Harv.* (PLATE LV.)
HAB. Most abundant at King George's Sound.

737. **mamillosum,** *Harv.* (PLATE XLI.)
HAB. Fremantle, Western Australia.

738. **Bursa,** *Ag.* (Harv. Phyc. Brit. t. 290.)
HAB. Lefebre Peninsula, *Dr. Mueller.* Port Fairy, *W. H. H.* (Coasts of middle and southern Europe. Rare in the south of England.)

739. **adhærens,** *Ag.* (Harv. Phyc. Brit. t. 35. A.)
HAB. Port Jackson, *W. H. H.* (New Zealand, Cape of Good Hope, and Ceylon, *W. H. H.* Mauritius, *Telfair.* Friendly Islands, *W. H. H.* Loochoo Islands, *C. Wright!* Coasts of Europe.)

CLXXVIII. **VAUCHERIA,** *De Candolle.*

(The Australian species have not been investigated.)

CLXXIX. **BRYOPSIS,** *Lamouroux.*

740. **plumosa,** *Lamx.* (Harv. Phyc. Brit. t. 3.)
HAB. Coasts of Australia and Tasmania, common. (Temperate ocean, north and south, abundantly. Tropical ocean, more rare.) [I have collected and received multitudes of Australian specimens of many varieties, which I do not separate—as many collectors may feel disposed to do—into "species."]

741. **australis,** *Sond.* (Pl. Preiss. ii. p. 152.)
HAB. Western Australia, *Preiss.*

742. **foliosa,** *Sond.* (Pl. Preiss. ii. p. 152.)
HAB. Western Australia, *Preiss.*

743. **gracilis,** *Sond.* (Pl. Preiss. ii. p. 152.)
HAB. Western Australia, *Preiss.*

Family XX. DASYCLADEÆ.

CLXXX. **POLYPHYSA,** *Lamouroux.*

744. **Peniculus,** *R. Br.* (PLATE XI.)
HAB. King George's Sound. Port Lincoln, *Wilhelme!* Port Phillip, *Dr. Mueller!*

745. **Cliftoni,** *Harv.* (PLATE CCLV.)
HAB. Western Australia, *G. Clifton.*

CLXXXI. **ACETABULARIA,** *Lamouroux.*

746. **Calyculus,** *Quoy and Gaim.* (PLATE CCXLIX.)
HAB. Western Australia.

Family XXI. VALONIACEÆ.

CLXXXII. **PENICILLUS,** *Lamarck.*

747. **Arbuscula,** *Mont.* (PLATE XXII.)
HAB. Rottnest Island, Western Australia.

CLXXXIII. **MICRODICTYON,** *Decaisne.*

748. **Agardhianum,** *Dcne.* (PLATE L.)
HAB. Lefebre Peninsula, *Dr. Mueller.* Port Jackson, abundantly. (Mediterranean Sea.)

CLXXXIV. **STRUVEA,** *Sonder.*

749. **macrophylla,** *Harv.* (PLATE VII.)
HAB. Western Australia, rare. Champion Bay and Bunbury.

750. **plumosa,** *Sond.* (PLATE XXXII.)
HAB. Rottnest Island, Western Australia, abundant.

CLXXXXV. **APJOHNIA,** *Harvey.*

751. **lætevirens,** *Harv.* (PLATE V.)
HAB. Port Lincoln, *Wilhelme.* Western Port, *W. H. H.* M'Donnell Bay, *Mrs. Wehl.*

CLXXXVI. **DICTYOSPHÆRIA,** *Decaisne.*

752. **sericea,** *Harv.* (Fl. Tasm. vol. ii. p. 339, t. 196. A.)
HAB. West and south coasts of Australia. Tasmania. [This is probably *D. favulosa,* Sond. in Linn., excl. syn.]

Family XXII. ULVACEÆ.

CLXXXVII. **PORPHYRA,** *Agardh.*

753. **Woolhousiæ,** *Harv.* (PLATE CCLXV.)
HAB. Parasitic on *Macrocystis.* Tasmania. (Cape Horn, *Lenormand.*)

754. **vulgaris,** *Ag.* (Harv. Phyc. Brit. t. 211.)
HAB. South coasts of Australia. (Temperate and colder oceans generally.)

755. **laciniata,** *Ag.* (Harv. Phyc. Brit. t. 92.)
HAB. Coasts of Australia and Tasmania. (Temperate and colder oceans.)

CLXXXVIIII. **ULVA,** *Agardh.*

756. **latissima,** *Ag.* (Harv. Phyc. Brit. t. 171.)
HAB. Australian coasts. Tasmania. Temperate and colder oceans.)

757. **rigida,** *Ag.* (Ag. Syst. p. 189.)
HAB. Western Australia, *Mylne, W. H. H.* (I venture to refer Sonder's *Phycoseris Ulva* to this plant.) (Atlantic and Mediterranean. Cape of Good Hope. New Zealand.)

758. **lactuca,** *Ag.* (Harv. Phyc. Brit. t. 243.)
HAB. Port Adelaide and Rivoli Bay, *Dr. Mueller.* Tasmania, *Stuart.* (Europe, and the north temperate oceans.)

CLXXXIX. **ENTEROMORPHA,** *Link.*

759. **compressa,** *Link.* (Harv. Phyc. Brit. t. 335.)
HAB. All parts of the coast and estuaries. (Cosmopolitan.)

760. **clathrata,** *Link.* (Harv. Phyc. Brit. tt. 344, 43, 340, 245, 263, 352, and 282.)
HAB. Lefebre Peninsula, *Dr. Mueller.* [A most variable plant.]

CXC. **BANGIA,** *Lyngbye.*

761. **pulchella,** *Harv.* (Fl. Tasm. ii. p. 342.)
HAB. Georgetown, Tasmania, *R. Gunn.* Warnamboul, *H. Watts* (82).

CXCI. **TETRASPORA,** *Link.*

762. **intricata,** *Berk. and Harv.* (Fl. Tasm. ii. p. 342.)
HAB. St. Patrick's River, Tasmania, *R. Gunn.*

Family XXIII. BATRACHOSPERMEÆ.

CXCII. BATRACHOSPERMUM, *Roth.*

763. **atrum**, *Harv.* (*Conf. atra*, Dillw. Conf. t. 11.)
HAB. Launceston, Tasmania, *R. Gunn.* (Europe.)

764. **moniliforme**, *Roth.* (*Conf. gelatinosa*, Dillw. Conf. t. 32.)
HAB. Tasmania, *Stuart, W. H. H.* (Europe and America.)

765. **vagum**, *Ag.* (Kütz. Sp. Alg. p. 536.)
HAB. Launceston, Tasmania. (Europe and America.)

Family XXIV. CONFERVACEÆ.

CXCIII. CLADOPHORA, *Kützing.*

766. **anastomosans**, *Harv.* (PLATE CI.)
HAB. Fremantle, Western Australia.

767. **Baineii**, *Muell. and Harv.* (PLATE CXII.)
HAB. Port Philip. Tasmania.

768. **Peredayi**, *Harv.* (PLATE XLVII.)
HAB. Georgetown, Tasmania.

769. **pellucida**, *Kütz.* (Harv. Phyc. Brit. t. 174.)
HAB. Rottnest Island, Western Australia, *Harv. Alg. Exsicc. n.* 583. (Cape of Good Hope. Shores of Europe.)

770. **gracilis**, *Griff.* (Harv. Phyc. Brit. t. 18.)
HAB. Tasmania.

771. **gracillima**, *Harv.* (Fl. Tasm. t. ii. p. 340.)
HAB. Tasmania.

772. **Stuartii**, *Harv.* (Fl. Tasm. ii. p. 340.)
HAB. Tasmania.

773. **valonioides**, *Sond.* (PLATE LXXVIII.)
HAB. Western Australia, common.

774. **nitidula**, *Sond.* (Pl. Preiss. ii. p. 149.)
HAB. Western Australia, *Preiss, G. Clifton!*

775. **ferruginea**, *Harv.* (Fl. Tasm. ii. p. 340.)
HAB. Tasmania.

776. **gossypina**, *Kütz.* (Kütz. Sp. p. 411, *fide* Sond. in Linn. xxv. p. 658.)
HAB. Port Adelaide, *Dr. Mueller.*

CXCIV. CHÆTOMORPHA, *Kützing.*

777. **Darwinii**, *Kütz.* (Fl. Tasm. ii. p. 341, t. 196. C.)
HAB. South coasts of Australia. Tasmania. (New Zealand.)

778. **coliformis**, *Mont.* (Fl. Tasm. ii. p. 341.)
HAB. South Port, Tasmania, *C. Stuart!* (Isle of Toud, *Herb. Mont.!*)

779. **aerea**, *Kütz.* (Harv. Phyc. Brit. t. 99. B.)
HAB. Warnamboul, *H. Watts, n.* 203.

780. **valida**, *Hook. f. and Harv.* (Fl. Tasm. ii. p. 341.)
HAB. South coasts of Australia and Tasmania.

CXCV. ŒDOGONIUM, *Link.*

781. **monile,** *Berk. and Harv.* (Fl. Tasm. ii. t. 196.)
HAB. Tasmania, in fresh water, *R. Gunn !*

782. **gracile,** *Kütz.* (Kütz. Sp. Alg. 366. Sond. Linn. xxv. p. 657.)
HAB. Tasmania, *Stuart.* (Europe.)

783. **stagnale,** *Kütz.* (Kütz. l. c. 368. Sond. l. c. 658.)
HAB. Tasmania, *Stuart.* (Europe.)

784. **capillare,** *Kütz.* (Kütz. l. c. Sond. l. c.)
HAB. Tasmania, *Stuart.* (Europe.)

CXCVI. CONFERVA, *Fries.*

785. **floccosa,** *Kütz.* (Sp. Alg. p. 371. Sond. l. c. 658.)
HAB. Kensington, Victoria, *Dr. Mueller.* (Cosmopolitan.)

Family XXV. ZYGNEMACEÆ.

Freshwater, confervoid Algæ, the Australian species of which have yet to be ascertained, and cannot be determined satisfactorily from dried specimens. I have received species belonging to the genera *Zygnema* and *Spirogyra.* Sonder (Linn. xxv. p. 658) enumerates five species, sent by Dr. Mueller.

Family XXVI. DESMIDEÆ.

Freshwater Algæ. Australian species not explored.

Family XXVII. OSCILLARIACEÆ.

CXCVII. RIVULARIA, *Roth.*

786. **australis,** *Harv.;* fronde maxima (1–1½ uncias diametro) solitaria hemisphærica solida lubrica olivaceo-viridi. *Trans. R. I. Acad.* xxii. *p.* 566.
HAB. Cape Riche, on rocks near low water.

787. **plicata,** *Carm.* (Harv. Phyc. Brit. t. 315.)
HAB. King George's Sound. (Shores of Britain.)

788. **nitida,** *Ag.* (Harv. Phyc. Brit. t. 68.)
HAB. Rivoli Bay. *Dr. Mueller !*, 1848. Brighton, Port Philip, *Dr. Mueller, W. H. H.* Georgetown, Tasmania. (Europe. Loochoo Islands.)

CXCVIII. LYNGBYA, *Agardh.*

789. **ferruginea,** *Ag.* (Harv. Phyc. Brit. t. 311.)
HAB. Tasmania. Port Fairy, *Harv. Alg. Exsicc. n.* 594. (Europe and America, in brackish water and the sea.)

790. **anguina,** *Mont.* (Sond. in Pl. Preiss. ii. p. 152.)
HAB. Western Australia, *Preiss.*

CXCIX. CALOTHRIX, *Agardh.*

791. **cæspitula,** *Harv.?* (Harv. Phyc. Brit. t. 305 ?)
HAB. Cape Riche. (Shores of Europe ?)

792. **limbata,** *Harv.;* cæspitosa, lætevirens, filis elongatis mollibus flexuosis latiuscule pellucido-marginatis hic illic cohærentibus, striis creberrimis. *Harv. Alg. Exsicc. Austr. t.* 596.
HAB. Rottnest Island, Western Australia.

793. **comoides,** *Harv.;* cæspitosa, nigroviridis, filis elongatis capillaribus valde flexuosis crispisve sæpius hic illic cohærentibus late pellucido-marginatis, striis inconspicuis. *Calothrices, n.* 597 *and* 598, *in Harv. Alg. Exsicc. Austr.*
HAB. Cape Riche, *W. H. H.*

794. **confervicola,** *Ag.* (Harv. Phyc. Brit. t. 254.)
HAB. Common on various small Algæ. (Cosmopolitan.)

795. **scopulorum,** *Ag.* (Harv. Phyc. Brit. t. 58. B.)
HAB. Seacoast rocks

796. **infestans,** *Harv.* (Fl. Tasm. ii. p. 343.)
HAB. Tasmania.

CC. **OSCILLATORIA,** *Vaucher.*

797. **limosa,** *Ag.* (Ag. Sp. Alg. p. 66.)
HAB. Lefebre Peninsula, *Dr. Mueller* (*fide Sond.*). (Europe, etc.)
[Many other "species" are probably to be found by looking for.]

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798. **fuscescens,** *Kütz.* (Kütz. Sp. Alg. p. 320; Sond. in Linn. xxv. p. 657.)
HAB. Tasmania, *Stuart.* (Europe.)

CCII. **HETERACTIS,** *Kützing.*

799. **pruniformis,** *Kütz.* (Sp. Alg. p. 334; Sond. in Linn. xxv. p. 657.)
HAB. Adelaide, *Dr. Mueller.* (Europe.)

Family XXVIII. DIATOMACEÆ.

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